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Essays and Cases.

ART. I. *Epidemic Cholera in Cincinnati.* By DANIEL DRAKE, M. D.

I. OUTBREAKING OF THE DISEASE.

From the time that Epidemic Cholera commenced at Quebec, it was an object of deep interest with me to watch its onset in Cincinnati, with a view to the great question of its mode of propagation. I propose to record the observations which I was enabled to make on this subject.

Although an inland town, of comparatively recent origin, Cincinnati is a place which has very extended and intimate relations with many others. Almost all who pass to and from the States east and west of it, and they are numerous, stop in the city. Three lines of stage coaches run perpetually between Sandusky and Cleaveland, on Lake Erie, and steam boats from Pittsburgh and Wheeling above, and New Orleans, St.

Louis, and Louisville, below, arrive and depart daily. Thus, if the Epidemic could be propagated by goods or persons, the means of introducing it were not wanting; and, as it prevailed in the basins of the Lakes and the upper Mississippi, for some time before it occurred in that of the Ohio, sources of contagion, if it be a contagious malady, were not wanting in places not more than three travelling days distance from us.

In the afternoon of the 9th of October, (1832) the steamboat Sylph arrived at our quay, with a passenger laboring under Epidemic Cholera. He was an European, who had left Kingston, in Upper Canada, nine days before, and crossing the State of Ohio, on the canal from Cleaveland to Portsmouth, 120 miles above Cincinnati, got on board the steam boat, at that place; about which time he was seized with the disease. In a few days after this time, the Epidemic was general over the city. But was it introduced by this patient? Fortunately for the cause of truth and humanity, this question can be decisively answered in the negative.

That I may not call on the readers of this Journal, to receive my *ipse dixit*, as evidence in so important a matter, I shall at once proceed to the proofs.

The following brief histories, composed of the most authentic materials, collected at the time, published in the gazettes of the city, and never questioned, will, I think, conclusively establish the fact, that the Epidemic commenced not on the 9th of October, but on the 30th of September, nine days before.

1. John Coonse, between Race and Elm, beyond the canal, drove a waggon on Saturday, Sept. 29, in the rain, and got wet; breakfasted next morning, and was preparing to go into the country, when about 9 o'clock he was seized with vomiting and diarrhœa—these symptoms continued for several hours, with cramps, coldness of the limbs, great restlessness, and intense thirst—his mind remaining regular. In the afternoon, his pulse ceased, his face became purple, his hands sodden and blue, and at six o'clock he expired, 9 hours after the attack.

Drs. Richmond and Wm. Smith attended this patient. Dr. Staughton, of the Board of Health, saw him a little before his

death. I did not see him till a few minutes afterwards. The next morning, Monday, October 1, Dr. Richmond, without having seen me, reported the case to the Board of Health as Epidemic Cholera. He and Dr. Wm. Smith, both believed at that time that such was its character.

2. John Mulholland, east end of Fifth street. Seized on Sunday night, September 30, at half past ten, with nausea and diarrhœa. In an hour had an icy coldness of the extremities, with violent spasms; ordinary contents of the stomach thrown up; from the bowels discharges at first brown, then watery and copious. Dr. Bonner, the physician called in, derived these particulars from the wife. When the Doctor arrived at 4 o'clock, A. M, six or seven hours after the disease set in, the patient presented the following symptoms: Surface of the body generally cold, clammy, and of violet color; eyes sunken, pulse gone, and respiration imperceptible—and yet the mental faculties were so unimpaired, that he asked for "25 drops of laudanum." In a quarter of an hour afterwards he expired. I had the symptoms of this case from Dr. Bonner himself.

3. James McClintock, cook of the steam boat Huntsman, running as a regular packet between this city and Louisville, at which place there was no Cholera, was attacked on the morning of the 30th of September, with diarrhœa. After heating himself in the kitchen, he stood, for some time, on the bow of the boat, then on her downward voyage, and had a chill. Took to his bunk, when vomiting and dreadful cramps in all his extremities came on. His alvine discharges were watery; and a dark circle formed around his eyes; his pulse sunk; and his body was covered with a cold perspiration. When the boat arrived at Louisville, Dr. Powell announced him in a state of collapse; and he expired the next morning, October 1st, at 2 o'clock.

4. Susan Hation, a negress on the Green, east end of Fifth street. Taken on Sunday night, September 30th, with puking and pain in the stomach and bowels—said not to have had diarrhœa. In the language of her colored friends, 'was cramped all over.' Retained her senses to the last. Died 12 hours from the attack

5. Rachel Brown, negress, in the same house with the last. Attended by Dr. Sparks. After having had diarrhœa for some time, was attacked with violent symptoms on Tuesday night, October 2. The Doctor saw her the next night, when her extremities were cold and her pulse gone; vomited but little: had cramps when she was first taken. Died on Thursday night.

6. Mr. Carsley, in New street, near the two last, a white man, was attacked at 10 o'clock on Monday morning, October 1, with vomiting, diarrhœa, and cold sweats; severe spasms came on, and in the language of his wife, his body and limbs became 'colder than death.' Dr. Obedorff being called, gave him laudanum. On Tuesday was better; but on the night of that day, had a return of all the symptoms. Retained his senses till he expired on the night of the 4th.

7. Robert Fleming. This victim lived 12 miles from Cincinnati, in the State of Kentucky. He spent four days in the city on business, and immediately after his return home, Oct. 4, was seized with vomiting and diarrhœa in the morning. Coldness and cramps came on, and he expired before night. Seen by Dr. Riggs, of Covington.

8. Daniel Underwood, a colored man, Sixth street, east of Broadway, after attending market on Friday Morning, October 5, was seized at 9 o'clock, A. M. with griping pains, diarrhœa, and severe spasms—at half past 2 P. M. pulseless, with clammy sweats, and his skin "so cold as to feel like the marble slab of the soda fountains;" at the same time he complained of being hot; excessively restless; rather flighty or absent in his mind; voice and countenance so altered that his friends said they should not have known him. Died the same evening. Attended by Dr. Lawrence.

9. George Price, a colored man, belonging to a steamboat which had been for some days out of commission. Was at Anderson's near where the last patient lived, on Wednesday evening, Oct. 3d, and seemed well; was brought back to Anderson's on Friday evening 5th; had been seized with "cramp colic," and had "cramps all over," with cold sweats. Died soon after his return. I could not learn what physician had attended him,

nor could I collect more than the above imperfect particulars for this case.

10. Ruth Hamilton, an old negress, living with a negro family, in a narrow and dirty alley, near the intersection of Sycamore and Columbia streets. Ate dinner and worked, on Thursday, October 4. Soon after dinner, which was of a common kind, was seized with "wonderful pain," and diarrhœa; vomiting of a watery fluid and cramps soon came; her skin got cold, she had "heavy sweats," complained of heat, and wanted fanning. Retained her senses to the last. Had no physician, and took no medicine. Died next morning, October 5, at 9 or 10 o'clock.

11. David Foder, a German, at the east end of Symmes' street. Had a diarrhœa for several days, but kept about. On Thursday night, October 4th, was seized with vomiting, and increase of diarrhœa. Dr. Eberle prescribed for him on Friday morning, and said he would see him again next day. The vomiting ceased, but the diarrhœa continued more or less; he was thirsty; coldness and cramps came on; his visage was blue and purple, and at 5 or 6 in the evening, he expired, retaining his senses to the last.

12. James Turner, negro, between Elm and Plumb streets, near the centre of the town, attended by Dr. Waldo, who furnished me with the facts. Went to bed well on Friday night, 6th Oct. Taken between 2 and 3, A. M. with severe diarrhœa, and violent spasms and sweats; the skin became very cold, the pulse ceased, and he expired at 6 o'clock, three hours after he was seized.

13. Mary Collins, a negress, on the Green, attended by Dr. Waldo, and visited by myself. Symptoms, diarrhœa, vomiting, cramps of the most painful kind, coldness, pulse at length imperceptible—death on the evening of the 6th.

14. Zacharias Nelson. Taken at 4 in the morning after two days of mild diarrhœa, with violent vomiting, cramps and coldness—diarrhœa increasing, with muddy and afterwards light colored discharges—in a few hours, the backs of both hands became sodden, and his nails blue; visage and gums purple; tongue and insides of the mouth cold, while

he still swallowed and had his senses. Upon bleeding, the blood thick and black as tar. Expired at 8 o'clock the same evening Oct. 6. Dr. Dart attended this patient. Dr. Marshall, saw him three hours before his death. I was with him during the last hour.

15. James Sharer, Plumb street, attended by Dr. Wiley. Attacked Saturday night, and died in four hours, with vomiting purging and spasms. Died 7th.

16. Joseph McIntyre, near Western Row and Second streets. Taken on the night of the 7th. Seen by Dr. Shotwell. Vomiting, purging, cold sweats, universal coldness, hands sodden and deep purple—died on Sunday the 7th. Seen by Dr. Eberle and Mr. Jones members of the Board of Health.

17. Nancy Hall, negress, near the same place. Symptoms of Epidemic Cholera complicated with Syphilis, in its advanced stages. Died 7th.

18. Elizabeth Roberts, lower end of Ludlow street. Walked to meeting on Sunday night, and died on Monday the 8th. Attended by Dr. Walker—seen by Dr. Rives, Dr. Price and myself. Symptoms—diarrhœa, vomiting, coldness, spasms, sodden state of the feet and hands, pulselessness for several hours, purple gums, black spots on the whites of the eyes—smoke color of the nails, retention of the senses to the last.

19. Richard Dement, lately a citizen of Cincinnati, but at the time of his illness, an inhabitant of Covington, on the opposite side of the river. Was in the city on Saturday afternoon, the 6th of October, ate hearty, and got wet before his return. Had a chill. In the night, at 4 o'clock, was seized with dreadful vomiting and diarrhœa; threw up the ingesta unaltered, and at length had rice-water discharges from the bowels; great coldness, and severe and painful cramps supervened; his visage sunk and became purplish; his hands were shrivelled and blue about the nails; his thirst, restlessness, and desire for fresh air, were extreme, and he expired about 5 o'clock in the evening. Dr. Smith, the chairman of a Sanitary Committee, of which I shall presently speak, was one of his physiclans.

20. Sears Crane, a wagoner, living in an alley between Elm

d Plumb, and Front and Second streets. Got wet on Saturday
t. 6th, and the next day felt unwell, with a loss of appetite. On
onday was seized with diarrhœa, and in the afternoon vomiting
me on; all the night following he had unquenchable thirst,
ith cramps. His face became purple, and his sodden fingers
a smoke color. Died at 10 A. M. Tuesday 9th. Was
tended by Dr. Waldo.

21. Archibald Baker, Fifth street, beyond Western Row, had
diarrhœa for some time, which greatly increased on Wednes-
y Oct. 3d. He subsequently had cramps in the stomach and
gs, with coldness of the latter, and still greater coldness of
e tongue, which with his lips became purple. His dis-
harges were watery, his respiration gasping, and his pulse be-
me imperceptible several hours before his death. He died
Monday morning, Oct. 8th. Attended by Dr. Richmond.

Thus, between the 30th of September and the 8th of Octo-
er, 21 fatal cases of Epidemic Cholera occurred in Cincinnati,
efore the arrival of the boat, which brought the patient
om Portsmouth. It was not, however, till after the occur-
ence of that case, that the Board of Health admitted the ex-
tence of the Epidemic in the city! Had they been ignorant
of these cases, their failure to announce the existence of the
Epidemic before the 10th of October, could not have been cen-
ured. But this was not the fact. On Saturday, the 6th of
October, I addressed a note to a member of the Board, in
which I gave him the names of ten of the victims mentioned
above, and assured him that they had died of Epidemic Cholera
within the week; the next day, I added another, and the suc-
ceding day detailed, to a different member, the symptoms of
another, who had just expired.

My *unofficial* note, (for as the patients whose cases I reported
were not mine, I was not required by the ordinances of the
council to report them,) was referred to a committee of the
Board, who, as I ascertained, intended to report, that they were
not cases of Epidemic Cholera; and on the same day, that this
reference was made, the Board sought an interview with Gen.
Scott, then in the city, to request of him not to suffer the troops,

who were returning from the Indian war, on the upper Mississippi, and had been affected with Cholera, to land at this place lest they should communicate the disease.

Regarding it as important to the safety of the people, that they should be apprized, without delay, of the existence of the Epidemic, and thoroughly convinced that it had been upon us for a week, I spoke publicly of the fact, immediately after my communication to the Board. The next morning, Sunday, I went still further. As a large proportion of those who had died were colored people, and the whole of that community were profoundly ignorant of the character of the disease and the means of prevention, I determined to address them on the subject. This I did in the afternoon of that day, in one of their largest churches; and have reason to believe that some good resulted from it, notwithstanding it was made a subject of derision, during the hour of its delivery, by the chairman of the committee, of which I have just spoken.

In this address, which was attended by several respectable and benevolent citizens, I asserted the undoubted existence of the Epidemic; but still the notification was so partial, that the great mass of our population were totally unconscious of the necessity of an immediate change in some of their habits, and of the importauce of attending strictly to the first symptoms of any disorder which might assail them. Under these circumstances, I felt at liberty to make a more public enunciation of what had fallen under my notice; and accordingly, in the afternoon of the same day, sent a communication to the offices of the different daily gazettes.

The distribution of the papers on the following morning, excited a deep sensation throughout the city. Many believed in the reality of what was stated, and censured the Board of Health; but more were incredulous, or affected to be, and expressed their reprobation of the author of the notice, in terms of unmeasured obloquy:—A fact that will account, and I hope be a sufficient apology for, this circumstantial narrative.

The Board of Health, not less than many of our citizens, were thrown into a state of excitement by this publication; and

immediately adopted a measure, which they presumed would relieve them from the reproach of unfaithfulness. This was to appoint and organize a "Sanatory Committee" of seven physicians, two of whom were members of their own body. These gentlemen were assembled *forthwith*, and proceeded to act *instanter*. They did not, however, go in quest of the information, necessary to a correct decision, nor send to me for the history of the cases I had reported; but, in the very hour of their appointment and convocation, drew up and subscribed the following certificate.

"*Board of Health, Cincinnati, October* 8, 1832.

The following report was made this day to the Board of Health, which being read was ordered to be published.

To the Board of Health:

The sanatory committee, acting under the authority of the Board of Health, report: That they have inquired into the circumstances and character of the cases which have been published as instances of Epidemic, Malignant, or Asiatic Cholera, together with some other cases of a like character, and from their own personal knowledge of many of those cases, and from information carefully collected in relation to the rest, they are convinced that these diseases have arisen from the usual exciting causes of bowel affections, or common cholera morbus, and that several of them have not been cases of cholera of any kind. (Signed)

Jesse Smith, M. D., Jedediah Cobb, M. D., V. C. Marshall, M. D., John Moorhead. M. D., Abel Slayback, John Eberle, M. D., J. M. Staughton, M. D.

Cincinnati, October 8, 1832.

The Board of Health assure their fellow citizens they will continue to investigate and examine into the character of all cases which come under their notice, and when any case shall be found to justify a belief that the epidemic cholera exists in this city, they will forthwith report the same to the public."

This document appeared in the gazettes, October 9th, the next morning after my publication, and was expected by the Board to quiet the public mind. The odds of seven to one, seemed fearful, but the contest was for a few hours only. Before night, the Epidemic had itself become umpire, and established the alarming fact of its existence in every part of the city. The papers of the next morning, October 10, contained

a report by the Board of Health, of four deaths from malignant Cholera; and the Sanatory Committee were never heard of again throughout the Epidemic!

For the moment, however, their certificate placed me on the horns of a dilemma. I was the oldest physician of the city, and had resided in it from the time it was an unsightly group of log cabins; I had written much for popular use, in its newspapers, through the summer, on the means of preventing the Epidemic; and had compiled and published a volume, on the same subject, for the profession in the valley of the Mississippi; but still, all who believed the Sanatory Committee, must believe me either ignorant of the characteristic symptoms of Epidemic Cholera; or disposed, wantonly, and wickedly to sound a false alarm.

The man of sensibility, wherever he may be, who can imagine himself placed in this predicament, will, I am sure, be inclined to pardon these details; and think it strange, that this committee should have felt themselves at liberty, or considered it safe for their own character, thus precipitately to impugn the accuracy, or the integrity, of a professional brother; but the fact is, that most of them were chosen, not for their *superior* professional standing, but for their known and ancient hostility to the humble individual, upon whose professional report they were called to sit in judgment. They were convoked, to gainsay his publication; and did not disappoint, if they failed to extricate, their employers. The chairman of the committee, moreover, going a little beyond the Board, and, the City Council, had, previously, declared his belief in the contagion of Cholera; and, although, but the day before, he had closed the eyes of Mr. Dement, who exhibited the characteristic symptoms of that malady, in an exquisite degree; still, he would not admit the existence of the Epidemic, till, on the succeeding day, a man arrived in a steam boat, with the disease upon him!

That the committee, in making up their certificate took counsel from their own feelings and the wishes of the Board of Health, instead of the facts which should have guided their inquiries and controlled their desires, I am compelled to believe; for they acted without the information necessary to a

correct decision; and one of them, the week before, had declared his conviction that the Epidemic influence was then upon us; another, on the very day that my publication was sent to the press, traced out the different symptoms of two patients then in a state of collapse, and pronounced them identical with those detailed in the books; and a third has since admitted, that he believed the cases I had reported to be Epidemic Cholera, at the time he signed the certificate! I take no pleasure in exposing these circumstances; but having through life made it a rule to correct misrepresentations of my character, either moral or professional, as soon as they were uttered, I am constrained to record this correction; and having done so, shall leave with pleasure, that which I approached with very different feelings.

There is, however, a much higher reason than one merely personal, for reviewing the proceedings of the Board of Health and their medical advisers. As the former was established by the City Council, under a law of the State, all its acts, including those of the latter, were official, and its publications might be referred to by the historians of the Epidemic, as authentic and credible. Now, on the 9th of October, these two public bodies, inform the world, that up to *that* time, there had been no Malignant Cholera in the city; but on the evening of that day, a steam boat passenger, emigrating from Canada, arrives with the disease upon him; and, expiring the next morning, is reported by the same authorities, as having died of that malady. Here, then, is a state of fact, which, considered apart from any other, would call for the conclusion, that the Epidemic had been actually introduced from the St. Lawrence—than which, nothing could be more foreign from the truth. The details which I gave, at the time, in the newspapers of the city, which were never contradicted or even doubted by its whole reading population, and, which are now presented to the profession, will serve, I trust, to preserve the future medical historian from so great an error.

Such is the history of the onset of Epidemic Cholera in Cincinnati. That it was not introduced from abroad, either by persons or things, is now universally believed; and, I may add,

during its whole continuance, not a single fact occurred, that went in the slightest degree to establish its contagious character. In a few cases, it is true, several members of a family were swept off in rapid and frightful succession; but the physicians, nurses, and visiters of these very families, escaped it. Instances of this kind are to be explained in part, by a reference to the similarity of constitution and the strong common susceptibility, existing in some families; and by the alarm, confusion and neglect of early symptoms, which were the necessary consequence of more than one member of a family, happening to be taken down at the same time.

Still it is undeniable, that facts have transpired (some of which will be found in the present number of this Journal) which seem to support the opinion that Epidemic Cholera *sometimes* spreads by contagion. I can only say, that admitting this to be true; the disease *may* originate independently of contagion. How many maladies conform to this law has not yet been ascertained; but canine madness is an example which cannot be questioned. Measles, scarlet fever, and typhus are more doubtful in this respect; but there are many facts which seem to indicate, that they are both epidemic and contagious. If, however, this be the case with Cholera, there can be no doubt that its contagious power is extremely feeble, and that it, generally, almost always indeed, depends on some unknown epidemic distemperature of the atmosphere. Its spread along navigable water courses, has been remarked from its origin in Asia, where, however, it is said to have extended, along the rivers that were not navigated, not less than those which were. Opportunities for observations on this latter point, do not exist in the United States, where every stream deep enough to float a steam boat is navigated; but of the tendency of the disease to appear first in the principal commercial towns and to stretch along our great rivers there can be no doubt. The facts on this point which relate to the Ohio and Mississippi, I shall mention presently.

It being definitively established that the Epidemic did not reach Cincinnati by contagious propagation, to what cause

should it be ascribed? This is a question, which no one can venture to answer. The facts furnished by its outbreak here, are altogether of a negative character; but prove, conclusively, that it did not reach us by contagion. They even prove more. They show, in a degree equally conclusive, that it did not originate from the sensible states of the atmosphere, for, without going into meteorological details, it may be safely affirmed, that there was nothing in the temperature, winds or weather, of September and October, that was in any degree peculiar, or different from ordinary autumns. Nor had miasmatic localities any apparent agency in its production; for it appeared in all parts of the city, high and low, thickly and thinly peopled, clean and dirty, nearly at the same time. Finally, it was not the offspring of a deleterious meteoration, gradually advancing upon us, and indicating its approach by its effects on human life as it passed along, for all the towns and country between the shores of Lake Erie and the banks of the Ohio river, an average distance of 250 miles were free from it, when it suddenly invaded, and rapidly pervaded, every part of our city. It appeared, however, nearly at the same time at Madison, 80, and at Louisville, 150 miles further down the Ohio; and at St. Louis, on the Mississippi, about 400 miles to the west and 175 miles above the confluence of the two rivers. Within a fortnight from its attack on these places, it showed itself at Maysville, Wheeling, and several other towns on the Ohio, above and below Cincinnati, leaving many places untouched. Thus, after reigning from June to October, in some part of the valley of the St. Lawrence, and its parent lakes, it suddenly appeared and spread up and down that of the Ohio, leaving the country between, untouched. From the southern shores of this river it advanced into the interior of Kentucky, reaching Frankfort and Lexington, near the latter end of October, and about the same time, commenced its ravages in New Orleans; while much, indeed, most of the extensive intervening country, between this and that city, like the State of Ohio up to this time, Nov. 30th, remains unaffected.

But we must not suppose, that the malady has appeared along

all our considerable water courses. The valleys of the Muskingum, Sciota, and Great Miami, traversing the southern half of the state, from north to south, have not been ravaged; nor have the people who live on the banks of the Ohio and Erie Canal, or the Cincinnati and Dayton Canal, been affected. The facts relative to the last, deserve a moment's notice. This canal runs for 20 miles back for Cincinnati, in the broad and deep alluvial valley of Mill Creek, when entering that of the Great Miami, having the same geological character, it continues in the vicinity of that river, to Dayton; passing through Hamilton and Middletown, besides a number of villages. Near the route of the canal lies the great road, along which are a line of daily stages to Dayton, and two to Hamilton. Throughout the whole reign of the Epidemic in Cincinnati, canal boats for Dayton, a distance of sixty miles, and for all the intervening towns, were departing daily with goods and passengers of all kinds; and the stage coaches were likewise filled as usual. But, still, the place just named, and indeed the whole valley of the Great Miami, remain to this hour uninfected. Now, if the Fpidemic can be spread either by men or merchandize, why was it not carried back, from Cincinnati, during the 30 days in which it prevailed? If it could be brought to this place, without our knowing whence or by whom, why should it not have been carried up the valley of the Great Miami, traversed as it was, by multitudes leaving our city every day? If it could be freighted from Cincinnati to New Orleans, in a steamboat, why was it not carried from the same city, to Dayton, in a canal boat; especially when the latter voyage occupies only a tenth part of the time of the former? These are questions which I think, the contagionists ought to consider and answer candidly.

In the last number of this Journal, I gave a brief history of the epidemic constitution of the summer season, which had just then expired. A perusal of that sketch cannot fail to impress the reader with the opinion, that in the months of June and July, we had, at this place, a distemperature of the general atmosphere, differing only in degree, from that which prevailed on the St. Lawrence. A state of unusual morbid irritability, in

the digestive organs, with numerous cases of mild or profuse diarrhœa, was almost universal through this region, particularly in the towns and cities; and many fatal cases of cholera, attended, indeed, with symptoms strongly characteristic of the Epidemic, occurred in the practice of different physicians; and suggested in their minds an apprehension, that the great visitation had actually commenced. With the departure of summer, this constitution subsided; and September was unmarked by any peculiarity in its diseases. With October the former state of things arose anew. The Epidemic, in its full and awful power was now upon us. Diarrhœas and morbid sensibility of the stomach and bowels were reproduced throughout our whole population; and fatal cases of cholera occurred by hundreds. Thus we have, in reality, experienced two invasions, one in June, of a mild and ambiguous character, in connexion with our endemic cholera morbus, and cholera infantum; the other, in the last week of September, in connexion with our autumnal fevers; or rather as a substitute for them, as they have, I think, been less prevalent this Fall, than usual. These facts, for such I esteem them, seem to me worthy of being recorded.

II. Progress, Duration, Eclectic Character and Mortality of the Disease.

The Epidemic, as I have just observed, may be said to have commenced with the month of October. During the first week, scattering cases, of a most fatal character, were almost all that occurred. The second week brought forth a frightful number of mortal, and a far greater number still, of mild cases. Through the third week the mortality was increasing; its maximum for a single day, was from noon of the 19th to the same hour of the 20th, when 42 deaths were reported to the Board of Health, which doubtless did not embrace the whole. Early in the fourth week, it began to decline, and by the end of the month was nearly extinct—no deaths being reported by the Board after the 4th of November. It prevailed as a *pervading* and fatal epidemic about two weeks, but its whole duration was six.

Much has been observed and written on the eclectic propen-

sity of this malady. In Cincinnati, this propensity was, I think, less manifest, than it seems to have been, elsewhere. The burden of mortality, certainly fell on the laboring classes, in low or middling circumstances; but these, it may be observed, make up the mass of the population; and, with due allowance for their neglect of the early and curable stages of the disease, it may be doubted, whether they were more *predisposed*, than the wealthy and more comfortable portions of the community. Of those who are sunk into abject poverty, with its noisome concomitants, filth and starvation, Cincinnati happily has but few; of these, a portion died, but many survived; and there does not seem to be any sufficient ground for affirming, that this degraded class suffered in a peculiar degree; but on this point I may be mistaken.

With respect to the intemperate, considered apart from the conditions to which I have just referred, I can speak with greater confidence. It is generally admitted, that contrary to all expectation, they were not more liable, than the temperate. No citizen of Cincinnati who will make an estimate of the proportional mortality of this pitiable class of the community, as far as his own personal knowledge can go, will, I think, dissent from what I have here stated. To what this exemption, in *our* city, so great when compared with many others, should be ascribed, it is difficult, perhaps, to say. Before the Epidemic set in, the Cincinnati Medical Society, drew up and published a paper of advice and instructions to the people, in which, referring to the use of ardent spirits, they advised, *that the temperate should not resort to drink as a means of warding off the disease, nor the intemperate refrain entirely, but only avoid drunkenness.* This advice was attacked in the newspapers by an anonymous writer, and pronounced unscientific and immoral. His strictures, provoked replies; and thus the whole matter became a current topic of popular interest and discussion, till it spread through all classes. How far this admonition was acted upon, either by the temperate or the intemperate, and contributed to the preservation of the latter, I am unable to say; but can assign no other cause for the escape of so large a proportion. Of the

strictly sober and orderly members of society, it is quite certain, that not a few perished; while habitual drunkenness on either side, remained exempt, or were but slightly affected.

I expect to be censured for *publishing* this fact. But I am writing a *medical history*, not a *temperance address*. From the latter, such a statement might properly be excluded; but the cause of scientific truth suffers from the suppression not less than the perversion of facts. There are obligations to science, as well as morality; and they can never, in fact, be incompatible. One of the physicians of the north of England, in writing of the epidemic to a friend, declares, that it affected the temperate and intemperate equally; but, adds, that for the interests of sobriety, it might be well enough to let the current opinion go uncontradicted. However, we "should not sin that grace may abound," and until the end will justify the means, we ought neither to suppress nor exaggerate facts in our efforts to prevent drunkenness. Moreover, I cannot attach much importance to the argument against that vice, which is furnished by the prevailing opinion, of the liability ot the intemperate to Cholera. To employ a slang phrase, suggested by the subject, as soon as the epidemic has reigned its 30 days and passed away, they who had held up, are sure to "treat resolution," and before the end of the year, ingurgitate the annual, average quantity. Those who war against intemperance, with its concomitant vices, may find in their magazines an abundance of weapons; without laboring to wield an occasional and transient epidemic against the hydra headed monster, whose ravages on society, are equally relentless in the midst of all events and through all seasons.

Our black population were unquestionably more liable to the disease, than the whites; and this, I apprehend, from national susceptibility; for it was by no means confined to the dissolute and indigent, but carried off a due proportion of those in comfortable circumstances and of respectable standing.

In its milder grades, the epidemic affected all ages and both sexes of whites, nearly in the same degree; but proved more fatal to adults than children; and to men than women. It is douhtful

how far a difference of constitution contributed to this difference in mortality between the two sexes; for as the occupations of man carry them more into the open air and expose them oftener to inclement weather, than those of women, we may ascribe apart, at least, of their greater sufferings to those causes—so apt to excite and aggravate the disease.

The total number of deaths from the Epidemic, will never, perhaps, be accurately known. Mr. Morrison, the clerk of the township, after availing himself of all official returns, and every other practicable source of information, estimates the number, from the 24th of September to the 20th of November, a period of eight weeks, at 571; which prnbably is not far from the truth. Supposing 26 of these to have been among strangers landing at the quay, we have a remainder of 545, for the mortality of the city. Of these 45 were negroes. Estimating our population at 30,000, of which 1500 may be negroes, and deducting them and the whites who fled to the country from the whole, we may assume 25,000 as the white population of the city and its liberties, during the Epidemic. Of this number 500 died, or one out of 50, a loss of two per cent., which is greater than that of most other places.

Among the whites the proportion of children who fell victims, was as 22 to 478; or something less than a 22d part.

I have, already said, that more males thau females were lost. Excluding chtldren whose sexes were not noted, the deaths among our adult white population, were 478, of whom 330 were males, and 148 females, being nearly as two and twenty-three hundredths to one. To take a different view of the relative mortality of the two sexes—the loss out of our male population was nearly one in 40, or more than two and a half per cent.—that sustained by our female population, was nearly one in every 80, or one and a quarter per cent.—giving a proproportion of mortality between the sexes as two to one.

I have likewise said, that our colored population suffered more severely than the white. Of the 545 who died in Cincinnati, and were of the city, 45 were negroes; although our black population does not exceed 1500. The ratio of its loss was

therefore three per cent.—or compared to that of the whites as one and a half to one.

III. Stages, Varieties, and Complications of the Disease.

It is a notorious fact, that in the temperate zone, Malignant Cholera has been every where preceded, or accompanied by, an epidemic diarrhœa. Now, these two affections either depend on the same, or on different causes. If the latter, why do they arise and subside together? Why does a neglected diarrhœa so often terminate in cholera? Why is the latter, in all individual cases, preceded by the former? Why does this, so often follow on that, in persons whose lives are saved? And why are the intestinal secretions so much alike in the two? Finally, if they have not a common origin, two distinct atmospheric poisons are generated at the same time, and entering into combination, agree to traverse the globe in the same direction, and make a simultaneous, but separate, attack upon the health and life of its inhabitants—occasionally coming to each other's aid in the work of destruction!

It seems to me unnecessary to multiply arguments to prove, that these two affections do *not* depend on distinct, but a common cause; and are, in fact, only different grades of the same disease. If this be true, it follows, that every kind and degree of indisposition, from the slightest affection of the stomach and bowels or of any other organ up to the most malignant—which depends on the atmospheric distemperature, is, in reality, a case of *the Epidemic*, though not of cholera morbus.

Even mortal cases have not, however, always presented the phenomena of that affection; while the milder, exhibit them in every degree and relative proportion to each other. With these facts before us, may we not wonder, that Boards of Health and governments, have been, every where, requiring medical men to report their *cases* of Cholera; at the same time, not expecting to have all cases of indisposition arising from the epidemic in-

fluence, included. I can perceive no truth or value in such reports. It is the deaths, only, that should be registered The relation of these to the population of a place may be ascertained; (and for this purpose, as well as to erect Cholera hospitals for the dying, boards of health are useful;) but the proportion of deaths to the number *indisposed* from the epidemic influence, is a problem which no board of health from Astrachan to New Orleans, has been able to solve. This ancient phrase, cholera morbus, suggesting, as it always does, a particular concourse of symptoms, is not, in fact, a suitable appellation, for an epidemic, which, in the majority of cases, does not exhibit that concourse; and should, though it cannot, be discarded. Its employment has led to the absurdity, of calling the milder forms and stages of a disease, *premonitory* of the more violent; and contributed powerfully and fatally to divert the minds of both physicians and people, from the former to the latter, when in fact the *reverse should have happened.* From this single error, millions of human beings have perished. I grant, that almost all who have written on the Epidemic, have spoken of the importance of attending to the disease in its first stage, which they have still, however, regarded as a mere state of premonition; of which they might treat in a short compass; while their greatest power has been reserved to pourtray the striking phenomena, morbid appearances, and complicated treatment of that stage, which in spite of all human genius, and an experisnce copiously accumulated, from the banks of the Ganges to the delta of the Mississippi, continues, in the majority of cases, to prove fatal; and which, I venture humbly to predict, would still prove fatal, were this pestilence again to overspread the earth. Had the horrors of this mortal stage not taken possession of the feelings and imagination of the world; and had physicians, the clergy, learned societies, boards of health and sanatory committees, governments, and benevolent individuals, every where, directed their chief attention upon the first and curable, instead of the last and incurable, stages of the disease; and labored to instruct the minds, and awaken the fears of the people, (in advance of the Epidemic) on the subject of its

first symptoms, I conscientiously believe, that one-half its mortality would have been averted.

To Dr. Kirk, of Greenock in Scotland, whose recent pamphlet on the Epidemic, was designed to prove, that a curable, *always* precedes the incurable stage, the interests of humanity are under the deepest obligations, though, his book has produced, I fear, but little effect; and the remark made by several medical gentlemen, in Canada, to Drs. DeKay and Rhinelander, that if a physician were sent for at the same moment, to see two patients, one of whom was slightly the other severely ill with the Epidemic, he should go first to the former, whom he might save, is entitled to universal approbation, and ought to be adopted as the rule of professional action.

I had not seen their Report containing this sound and precious advice, when the Epidemic made its advent at this place; but the experience of the few first days brought me irresistably to the same conclusion; and, I believe, produced a similar conviction, in the minds of many others. From this moment, I felt it a duty by every possible effort, to carry this momentous truth home to the understanding and feelings of the whole community; and, accordingly, inserted in the newspapers, and disseminated in the form of handbills, those solemn warnings and exhortations to the people, which brought upon me the sarcasms of those who should have been employed in the same duty. In reply to the whole, I shall only say, that the consciousness of having thus saved the life of a single human being, weighs more with me, than all the sneers, to which my humble, but earnest exertions gave origin.

The symptoms of the Epidemic presented in Cincinnati, no peculiarity worthy of notice. In its early periods, diarrhœa was the prominent affection; and the discharges were, *generally*, such as indicate a deficient biliary secretion with an increase of that from the mucous membrane. In many instances it was attended with abdominal pain, in others not. In some cases the diarrhœa was replaced by constipation; a condition, which a number of persons labored to promote or suffered to continue, under a mistaken idea, of its preservative influence. Loss of appetite,

nausea, and moderate vomiting, occasionally attended the early periods of the complaint; but more commonly, the stomach was much less affected in these stages, than the bowels. The skin, like the liver, failed in its functions, from the beginning, and was prone to become dry, cool and husky. Some persons had an excited and feverish circulation; but in the greater number, the pulse was reduced in energy, and afforded no evidence of inflammatory orgasm. The muscular system was generally reduced in its powers, and more or less, affected with cramps or slight spasms, particularly in the lower extremities, symptoms which frequently affected those who labored under no obvious disorder in the digestive organs. Multitudes had only these symptoms; and, when attentive to their modes of living, and careful, in the more violent cases, to seek early medical advice, escaped the more formidable accession of symptoms, which indicated a dangerous condition. This access was sometimes so sudden, that the person, occupied abroad, would be unable to walk home, and even sink down on the ground from debility. Such instances, not, however, very numerous, spread great terror through the city; as the individuals were, generally, supposed to have been previously in good health. I believe, however, that without a single exception, they had labored under a previous diarrhœa, which they regarded as something distinct from Cholera, or as a stage of that disease, which might be safely neglected; and therefore continued on their feet in the open air, the very worst condition under which they could have kept themselves.

The transition of the disease, from a mild to a malignant state, was often spontaneous; but more frequently could be traced up to irregularities of diet or drinks, great exertion, exposure to the night air, alarm or getting wet.

The symptoms which attended the exasperation of the malady, were, generally, increase of diarrhœa—the excretions becoming more serous, and assuming the appearance of rice-water, gruel, or milk and water; vomiting; great distress in the pit of the stomach or in the bowels; thirst; a hurried state of the circulation, with a pulse, sometimes augmented, but oftener

reduced in force; great muscular debility; restlessness; anxiety; and, in general, more or less chilliness. When these symptoms supervened, the patient was, I believe, always lost, if not preserved by medical skill. This, however, was, in most cases, called to his aid, for the patient, *now*, believed himself affected with Cholera, and took that alarm, which, coming upon him at an earlier period, might have prevented a concourse of symptoms, that too often proved fatal, notwithstanding a resort to the aid of our ablest pratitioners. Even in this condition, however, it happened (within my own knowledge) that from the multitude of strangers of the poorer and more ignorant classes, at all times in Cincinnati, some were unattended by any physician, and expired without having been made the subjects of any regular treatment! No part of this blame should, I think, be attached to the Board of Health or the Trustees of the Township, who, as far as I saw or heard, were humane and diligent in discharge of their duties throughout the Epidemic; nor should it fall on the medical gentlemen of the city, who were equally indefatigable in their labors, and gave promptly to the poor, both in advice and medicines, whenever called upon for either. And here I must be permitted to indulge in a sentiment of professional pride, while I claim for those who pursue the practice of medicine, while pestilential diseases prevail, a degree of praise which I think cannot justly be claimed for any other body of men in society. Their personal exposure and fatigue are incessant, and the night brings them but little rest; their attention is distracted by opposing importunities; their understandings perplexed, and their feelings tortured; their earnings, it is true, are increased, but their charities are, also, augmented; and these are not unfrequently dispensed in money, as well as visits, advice and medicines. On the whole, apart from all apprehension of personal danger, no physician can desire to encounter a pestilence a second time; and no community thus visited, should withhold from a profession which bears the shield of Minerva, and intercepts the arrows of death, the tribute of its gratitude.

The stage of Cholera, to which I have just referred, when not arrested by art, passed into that of general prostration, or

collapse, as it has been figuratively called. The vomiting, if violent before, now often abated, and sometimes ceased altogether; the diarrhœa became less profuse, or stopped entirely; the spasms and cramps in some cases became more violent, but in others subsided; the same thing was true of the jactation or restlessness, which in some patients continued to increase, while in a greater number, perhaps, it gave place to a mild degree of coma; the difficulty of breathing, and the desire for fresh air, were in most instances distressing. In all cases, the pulse sunk rapidly, becoming weak, thready, vermicular, and at length imperceptible, though the patient might still live on for hours. With the faultering of the pulse, the heart also failed; and, while the patient was still conscious, and obedient to all that was said to him, that organ would contract so feebly, that neither its sound nor impulse could be perceived, by the ear applied to the chest. Coldness of the surface, particularly of the extremities, the mouth and tongue, was among the symptoms of the stage we are now considering. Suffering no diminution, it often became icy, long before the patient expired; and was, generally, attended with a profuse discharge of perspiration, which of course, felt cold at the moment of its transudation through the skin. While the secretions from the gastro-intestinal mucous membrane, and the external surface of the body were thus successively increased, that from the kidneys, was diminished or entirely suspended. I have no doubt, from the complexion which the patient assumed, that the pulmonary secretion of carbon, was likewise much reduced; but know of no direct experiments having been made to ascertain the fact. The morbid complexion, was some shade of purple or blue, inclining to smoke color. The former exhibited, chiefly, by the face, the gums, and the epithelium of the lips, the latter by the toes and fingers. These discolorations, which very much resembled those attendent on the last stages of acute bronchitis, continued after death, and might easily be distinguished from the hyperæmias, formed at that time. In one case which fell under my observation, the adnata of the eyes, exhibited large, irregular spots, as black as charcoal. The parboiled and sod-

ken appearance of the hands and feet, described by all the historians of the Epidemic, was seldom absent. Finally, the intellectual functions, although in most cases reduced in energy, and often somewhat irregular, were, generally, so unimpaired, that the patient would attempt to project his tongue or swallow, when bidden, and often manifest an interest in the means of cure, till within a few minutes of his decease. This event was sometimes preceded by violent gaspings and agitations; but other cases presented a departure so calm and resigned, that the moment of dissolution could scarcely be perceived.

The duration of the state of collapse was various. When the patient was not resuscitated by art, he sunk rapidly; but, in some instances, his resuscitation was prompt and perfect, and his recovery speedy. In others it was partial and imperfect, and he would live on, sinking and rising, like a drowning man, for two or three days, and then expire, or slowly recover. Of those who fell into a deep and decided collapse, but few seem to have been saved.

It is impossible to say what proportion had consecutive fever. When it occurred, it was generally attended with extreme irritability of the stomach, and often with a manifest affection of the brain, accompanied, in some cases, with an engorged and purulent state of the eyes.

Considering that the Epidemic invaded us, the season when the autumnal intermittent and remittent fevers prevail, I cannot learn, that so many cases commenced and terminated with that febrile type, as might have been expected, though the number was not a few. Dr. Finley has communicated to me a case, commencing as Cholera and passing into the stage of collapse, which was evidently modified, by the endemic, autumnal distemperature; for after being preceded by a moderate degree of reaction, the paroxysm of collapse, unattended, however, with chilliness, recurred for three successive mornings, succeded each time by reaction in the afternoon. The patient, in obedience to his own instincts was stimulated powerfully and recovered. I was called into consultation, by my late pupil Dr. Shotwell, in the first week of the Epidemic, in consequence of a similar trans-

ition. His patient, a young man, was recovering from an attack of intermittent fever, when diarrhœa supervened; his circulation began to fail, his extremities became cold, and his hands sodden. In this condition he struggled on for several days, his pulse being nearly or quite imperceptible for a day or two before his death; while his intellectual functions were but little impaired. In consultation with Dr. Henry, I saw another case, which presented nearly the same mode of termination. An infant, after laboring under a malady which presented the phenomena of remittent fever, seemed to become convalescent; when its pulse began to sink, and at length became imperceptible, with other symptoms, characteristic of the stage of collapse, which continued till it expired.

A number of cases occurred under the denomination of autumnal fever, but attended, with diarrhœa, instead of the constipation usual in that fever, with serous alvine discharges and wandering cramps.

Dr. Woodward has obligingly favored me with the notes of a case of Cholera complicated with scarlatina. The patient, a female child, aged four years, was seized with fever, swelling of the tonsels, difficult deglutition, diffused inflammation of the fauces, and *vomiting*. In a few hours a *diarrhœa* came on attended with watery discharges, which, at length, assumed the *rice*-water appearance. In a couple of days, a scarlet rash showed itself on the lower part of the abdomen, which soon assumed a mahogany color, and before the little patient expired, this complexion became general.

The very first case of the Epidemic which occurred in my practice, in September, was attended with copious and alarming uterine hæmorrhage, during nearly the whole period of the vomiting and diarrhœa. The patient's pulse became nearly imperceptible, her skin cold and damp, and her lips purple; but contrary to expectation, she recovered.

Dr. Henry also met with two or three cases of hæmorrhage, or excessive menstruation, in connexion with Cholera; but whether they occurred in the practice of other gentlemen I cannot say.

Towards the decline of the Epidemic, many cases were complicated with, or terminated in dysentery.

As might be supposed, hysteria was a frequent occurrence throughout the whole Epidemic. In many instances it was excited by apprehension of the cholera, in others by the cause of that malady, more commonly by both. The excessively reduced diet, moreover, to which some persons subjected themselves, predisposed them to nervous irritations. In some cases, the paroxysm of hysteria subsided, without being followed by Cholera; but in others that malady supervened. I met with one lady in whom the Epidemic commenced as hysteria, with extreme anxiety of mind, following on a sudden death in the family from the prevailing disease. No vomiting existed, and the bowels were rather costive. The nervous irritation, with some degree of fever, continued for two days, when vomiting, cramps, and coldness, suddenly supervened; and the patient, with blue and sodden hands, expired in about eight hours. Hence it was important, for the physician to be on his guard, in reference to hysterical symptoms.

An equal degree of vigilance was, in fact necessary in regard to every kind of indisposition which occurred, for any departure from health, by whatever cause produced, was apt to terminate in Cholera. I met with one case, in which the patient, taken down with an inflammatory affection of the brain, to which he was liable, had slight *cramps* from the beginning; and ten or twelve days from the time of attack, after he had lost more than sixty ounces of blood, many additional symptoms of Cholera supervened, and contributed to prolong his confinement.

In its disposition to bend itself with, or modify other maladies—to terminate in them, and be excited by them—the Cholera but conformed itself to the laws which govern other epidemic diseases. Dr. Rush, among the more modern writers, has spoken exphatically on the importance of keeping these facts constantly in view, when a particular atmospheric distemperature is prevalent. The following anecdote will show, that this distinguished physician, observed his own precepts. During the Yellow Fever of 1793, on entering the suburbs of Philadelphia from the country, he was stopped to see a man,

who had just got his leg broke; not practising surgery, he directed the friends to send for a surgeon, and contented himself with prescribing his favorite "ten and ten" dose of calomel and jalap. The by-standers thought him deranged; but the Doctor knew from experience, that such a casualty was likely to awaken in the system of the patient, the fever to which they were all so strongly predisposed, and he prescribed accordingly.

I have stated a case which presented an actual complication of Cholera with scarlatina. I come now to say, that the latter affection, has been, and still is, a coadjutor of the former, in the work of death throughout the valley of the Ohio. In the winter of 1830–31, it was extremely prevalent, and fatal in Pittsburg; and ever since, it has been prevailing in different parts of Ohio and Kentucky—chiefly in the country, and smaller towns. Scattering, and generally mild cases only, have occurred in Cincinnati; but in Lexington, it has within the last few months, been fatal to many children. It would almost seem, that there is some connexion or *understanding* between this epidemic and Cholera. I believe, that as yet, they have not both been decidedly prevalent in the same place. Pittsburgh, which was so fatally visited by scarlatina, has had very little Cholera; nearly the same remark is true of Lexington. The State of Ohio, moreover, has been extensively visited by scarlatina; but remained almost exempt from Cholera, except in Cincinnati. That city, on the other hand, has been spared the scarlatina, but sorely visited with Cholera. The former disease has come even to its limits without entering to any formidable degree. In the village of Montgomery, 17 miles north of the city, it was extremely prevalent during the preceding summer, when scarcely a case occurred here. Dr. Branch, a respectable young physician of that place, has given me an account of nearly 30 cases, which presented themselves in his own practice.

Since writing the above, I have been informed by Dr. Hildreth, an intelligent student of medicine, that, the scarlatina has prevailed for some time past, in the valley of the Muskingum, where little or none of the Epidemic Cholera has shown itself. From Dr. Johnson, of McConnellsville, on the bank of

that river, he learned, that the scarlatina had been, during the past summer, extremely prevalent at that place; and was attended with such an irritable state of the bowels, and so great a tendency to diarrhœa, as to preclude the use of all cathartics except calomel, and suggest to his mind, that the scarlatina and Cholera influences were actually combined; the former, however, being predominant.

In the last number of this Journal, I have mentioned, that an influenza of a decidedly violent type, traversed the western country in November, December and January, 1831–2, but a few months before the Cholera. It also prevailed in the Atlantic States and in Europe.

Mr. Noah Webster, in his learned, but neglected work on Epidemic diseases, of which I hope he will give the profession a new and revised edition, has said much on the relation of influenza and scarlatina with pestilential epidemics. The history of the years 1831 and 32, in the western states, would certainly furnish many facts in support of his propositions. The connecting links among them, will probably never be revealed to us; but the facts which establish the reality of their combination deserve to be recorded. They should all be diligently studied, as to their modes of propagation; and thus be made, if possible, to throw light on each other's paths.

We constantly speak of the mysterious march of Cholera, but is not that of other epidemics equally wonderful? Let us take influenza as an example.

The late Epidemic catarrh commenced in the East, overspread Europe, crossed the Atlantic, and extended its march into the valley of the Mississippi—so did the Epidemic Cholera.

They both prevail in all states of weather; and are, therefore, independent of the sensible qualities of the atmosphere.

Epidemic Catarrh or Influenza, is an irritation of the mucous membrane of the ærial passages—Epidemic Cholera of the mucous membrane of the digestive passages. The former bears a striking resemblance to common or endemic catarrh, the latter to common, endemic cholera morbus.

Each of them is supposed by the people to be contagious;

but their sudden appearance throughout a whole city, without the possibility of tracing up the first cases to importation, the indisposition in some slight degree, at least, of nearly the entire population of a place, their brief duration, and sudden disappearance—indicate an atmospheric origin; and, as these characteristics are common to both, they bring them under one law of propagation, and clearly indicate, that if the Influenza is not contagious, we are not at liberty without *positive* proofs, to believe in the contagiousness of Cholera.

It would not be difficult to trace out other analogies between these epidemics; but every reader can extend the parallel, and convince himself, that they differ chiefly in the rapidity of their progress, and the destruction of human life which they respectively occasion.

I am aware, that to bring Epidemic Cholera under the same laws of propagation as Epidemic Catarrh, is not an explanation, in reference to the former, unless we knew the mode in which the latter extends itself; but it is one step towards a knowledge of the latent causes of these epidemics, to show that they overrun the earth under the government of one system of laws.

IV. Pathology.

It is not my desire to go extensively into this subject. We are ignorant of the part of the body on which the poison makes its impress, and of the nature of that impression; but the disturbance or impairment of the different functions may be observed and estimated. Reasoning from the phenomena which they exhibited, in those who were affected in Cincinnati, I would say, that the remote cause, was both depressing, and irritating in its effects. The majority of those who suffered, were evidently debilitated, in both the organs of animal and nutritive life. In some cases, it is true, inflammatory fever was developed; but this was the consequence of temperament or idiosyncracy; and might be compared to the exciting effects of digitalis, when administered to persons of a sanguine temperament, who had not been subjected to the loss of blood previous

to its use. Such cases must have occurred to every experienced physician. Examples of Cholera attended with active inflammatory symptoms, were, in fact, exceptions to the rule: the majority displayed only the signs of nervous irritation. The consequence of this morbid condition of the nervous system were perceptible in nearly all the functions. The gastro-intestinal mucous membrane was in a state of irritation and morbid secretion; the muscular coat associated with it, was thrown into increased and irregular contraction; the liver was nearly paralized in its specific function, so that little or no bile was secreted; the kidneys, especially in the advanced stages of the disease, acted feebly or not at all; the pulmonary mucous membrane, in a few persons, was irritated into catarrhal secretion; the skin was deeply impaired, both in its calorific and perspiratory functions; the muscles of locomotion were irritable, and disposed to take on spasmodic action; the heart was enfeebled, and the vessels appeared to co-operate badly with it, in propelling the blood to the more distant parts of the body; lastly, the lungs did not properly decarbonize the blood. All these different functional disturbances, seemed to me to result in a great degree, from an overthrow of the great, presiding function of innervation, accompanied in a few persons with developed inflammation, especially in the mucous membrane of the stomach and bowels.

As the nervous system is, in fact, *one* great apparatus *modified* in its different parts, or what is the same thing, in the different organs, it does not seem to be very important for us to ascertain which part receives the blow in Cholera. The effect spreads rapidly throughout the whole of that universal tissue, and impairs of course the functions of the various organs where it is present.

Now whether the remote cause be applied to the skin, the mucous membrane of the stomach and bowels, the mucous membrane of the lungs, or being absorbed through that membrane, it act upon the blood or inner lining of the vessels, the effects on the functions may still be the same, and the means of correcting them the same.

From these views, two great indications of cure spontaneously arose. First, to allay the irritation of the nervous system; and, secondly, to restore the impaired or suspended secretions, and restrain those which were in excess. When these indications could be fulfilled, the patient was saved, when they could not, he died. If, however, his temperament and habit strongly predisposed him to inflammation, the first indication was replaced, by that diminishing plethora and subduing inflammotory action.

These brief, and, perhaps, superficial speculations, are applicable to the earlier stages of the disease, rather than that of collapse, or prostration of all the functions—a state concerning which I am not disposed to add any thing to the many volumes now before the profession. I have already expressed the opinion, that, much harm has resulted from directing too much thought and care upon this *closing* period of the disease, instead of that in which it is a mild and manageable complaint; and shall, therefore, ask the attention of the reader chiefly to the latter.

V. Treatment.

The more common and regular cases of the Epidemic, presented three stages, each running into the other—these were *Diarrhœa*, *Cholera* and *Collapse*. The first was sometimes attended with cramps in small portions of the muscular system; the second with more extensive cramps, and, in many cases, violent spasms; the third was often without either. A failure in the functions of the skin and liver existed from the beginning, and increased through all the *stadia* of the disease. The rice-water discharges belonged to the second and third. The means of fulfilling, in the first stage, the two great indications of cure, laid down in the preceding section, were few and simple, but when employed in the proper time and manner, proved almost invariably successful. I proceed to enumerate them.

1. The first step was to confine the patient to his bed, or at least to a warm room. In many cases it was extremely difficult

to accomplish this; and I have no doubt that its absurd and presumptous neglect, destroyed a great number who might have been saved. In my own practice, I made it a rule, to refuse prescribing for any one laboring under a diarrhœa, unless he would promise to observe this *sine qua non* to the success of any other prescription. To keep on one's feet, abroad, in the cool or damp atmosphere, with diarrhœa, and suspended action of the skin and liver, must always be injurious; but to do so when these symptoms arise from the poison, which produces Epidemic Cholera, is fatal. Believing that to be successful, we should begin with this disease, in the first stage, and that the most important prescription we can make is a warm bed, I cannot too strongly urge on all who may see these pages, and have yet to combat the enemy, the indispensible necessity of coercing their patients on this point.

2. On taking to his room or bed, it was of great service to the patient to use a general warm bath, or bathe his feet in warm water, rendered stimulating with salt or powdered mustard. If the functions of the skin were not *deeply* impaired, they were much improved by this measure.

3. As the patient's appetite was frequently unimpaired, it was necessary to prohibit its indulgence. Solid food was constantly injurious. Almost total abstinence was best; and what he took, was least offensive when it consisted of solutions of fecula and gelatin—such as thin arrow root jelly and weak broths.

4. A hot infusion of some diaphoretic simple, such as balm, sassafras, sage, or thoroughwort, the *Eupatorium perfoliatum* of the Botanists, one of our native plants, was of great service. The last is the most powerful sudorific of the whole; and was, therefore, well adapted to the object in view; but being a nauseant, when the infusion was strong or the stomach irritable, it sometimes produced a vomiting, that was mistaken for that attendant on the disease.

5. The aqueous solution of camphor, effected by the aid of magnesia, as proposed I believe by Dr. Parish, an eminent physician of Philadelphia, was found useful as a diaphoretic; but I met with no facts that went in the slightest degree to sustain

the reputation of that medicine as a *specific* in any stage of Cholera.

6. These measures being adopted in reference chiefly to the state of the skin, it was necessary to institute others, calculated to quiet the bowels, diminish their watery secretions, and restore the suspended action of the liver. These ends were sometimes accomplished by a salt or mustard seed emetic; in other cases, by an active cathartic of calomel and jalap, or calomel and rhubarb, or pills of calomel and the resinous cathartics, which, if the patient were of a full habit, and the diarrhœa had not continued very long, were attended with excellent effects. Other cases were successfully treated with large doses of calomel alone, such as twenty or thirty grains, given at once, and worked off the next day, with infusion of senna, or rhubarb and magnesia, or castor oil. The sulphates of magnesia and soda, were generally rejected, as being apt to promote watery secretions. The practice, however, which was generally pursued by the physicians of the city, and by the people in numerous instances without the *immediate* advice of any medical man, after it was recommended in the newspapers, was to administer calomel and opium combined; and this practice, I am persuaded was far more successful than any other. The opium being pulverized, the compound was exhibited in powder. The proportion of these two ingredients was varied according to the judgment of the physician, to suit the age and condition of different patients. One grain of opium to ten of calomel, constituted a common or average dose, to be repeated every three, four, or six hours. Sometimes the proportion of calomel was doubled, so that the patient soon took, forty, sixty, eighty, or a hundred grains of that medicine; but this energy was required in violent and threatening cases only. Instead of increasing the dose of calomel, the physician, in many cases, diminished that of the opium to half a grain or less. This was advisable in all cases, attended with fullness of habit, inconsiderable diarrhœa, or peculiarity of constitution in reference to narcotics. In the last case, it was sometimes found advantageous, to substitute the sulphate or acetate of morphia for the opium itself.

By this compound of calomel and opium, or its narcotic principle, the two great indications of which I have spoken, were, in general, effectually fulfilled. It accomplished, in the average of cases, what neither of the medicines separately could have effected; though a number, for various reasons, required the opium to be omitted. In others, from the prejudices of the patient, or some other cause, the calomel was rejected; but I believe few were satisfied with the results of this practice, except that mineral was replaced by the blue pill, rhubarb, scammony, jalap, or some other active cathartic. In the midst of these diversities, it still remains true, that the powder of calomel and opium, was the most efficient means which could be employed, in the stage of the disease we are now considering. One of its first effects was to allay the general nervous irritation, tranquilize the feelings of the patient, diffuse a glow throughout his system, appease his cramps if any existed, and moderate or suspend the violent peristaltic action of his bowels. To these, succeeded other effects, of an auspicious kind; such as an abatement in the mordid secretions of the mucous membrane, a general perspiration, an equable distribution of the heat of the surface, and at length a restoration of the suspended or impaired biliary secretion, the consequence and sign of returning health in the portal viscera. Whenever the alvine discharges became bilious, the patient was considered as safe; though too early a discontinuance of the medicine, or indulgences in diet, or going prematurely abroad, not unfrequently reproduced the disease. In most cases, the calomel would at length operate as an aperient, but sometimes it became necessary to administer a more active cathartic, in consequence of an unusual torpor of the intestines from the action of the opium.

When I reflect on the beneficial fruits of this practice, in Cincinnati, I cannot but feel some astonishment and regret, that it should not have been pursued *every where*. Had calomel been more liberally employed in Paris, might not the mortality of its citizens have been less than it was? The timidity of the French practice in regard to this medicine, is certainly not the

offspring of observation, so much as ancient prejudice. The phenomena of the Epidemic in the metropolis of France, seem to have been almost identical with those which it exhibited in this city, and why should they not be met by the same therapeutic agent? If the citizens of the two places had very different constitutions, the effects of the Epidemic poison would have been different; but this does not seem to have been the case, and we are at liberty, therefore, to suppose, that the effects of calomel in France would have been as beneficial as in Ohio. However this may be, I consider the fact fully and firmly established, that calomel should be the basis of the treatment of Cholera in the valley of the Mississippi.

7. Cases occasionally occurred, in which bloodletting, either general or local, was demanded in the first or diarrhœal stage; but they were comparatively few in number. The pulse served as a guide in these cases; but indications were likewise drawn from the state of the abdomen. When this was tender on pressure, or distended and hard, or colic-pains supervened, blood-letting was required and did much good. To many of these cases, cupping or leeching would undoubtedly have been well adapted, and the former was sometimes employed with advantage; but from the want of a professional cupper, and our entire destitution of leeches, topical blood-letting was not often an available remedy.

8. Emollient fomentations to the epigastric and umbilical regions, were attended with a soothing and happy effect on the stomach and bowels; and contributed to excite the skin, and, perhaps, also, the liver.

Such were the means by which our physicians, generally, combatted the disease in its first stage; and they were almost invariably successful. Could the necessity of having early recourse to them, have been rendered manifest to our whole population, but few would have perished; but so rapid was the spread of the Epidemic, and so inadequate the utmost individual exertion, that this important information, was by no means so extensively disseminated as it should have been. Had the Board of Health, the Sanatory Committee, and the Trustees of

the Township, co-operating with individuals and the Cincinnati Medical Society, at an early period, devoted some part of their time, and the public moneys placed at their disposal, to the diffusion of this kind of knowledge, instead of directing their charities upon the dying and the dead, the amount of their benefactions would have been much greater, than it proved to be. It is better to preserve one man from serious illness, than to bury a dozen at the public expense.

The treatment of the second stage or that which exhibited the symptoms of cholera morbus, did not differ materially from that which the stage of diarrhœa required.

The patient thus affected, was of course in bed, and had no disposition to take food; but he was invariably restless, and while he continued in that state, perspiration could not be induced.

When he had fever the lancet was beneficial; and cupping over the abdomen, either with or without scarification, was of service.

A sinapism, a blister, or a piece of flannel dipped in hot oil of turpentine, bound over the epigastrium, often tranquillized the stomach.

When the vomiting had not continued very long, or had not been copious, the operation of a mustard or salt emetic, was often followed by a cessation of that sympton.

It is, especially, to this stage of the disease, that the saline treatment with the non-purgative salts, as recommended by Dr. Stevens of London, was adapted. It was but little employed, however, in Cincinnati; partly I presume, from his book not having been generally read, and partly from an unwillingness to depart from the prevailing plan of treatment. I directed it once in the diarrhœal stage, and it proved successful. In another case, attended with vomiting it was unavailing. Dr. Colby, I am informed, found it to succeed perfectly in one violent case. Dr. Richards has informed me, that he obtained advantage, in many cases of obstinate vomiting, from small and repeated doses of the sulphate of magnesia.

The hot diaphoretic infusions, so serviceable in the first stage, were promptly rejected and did harm in the second, at least,

until the vomiting was subdued. On the other hand, the effervescing saline mixture, or the common portable soda powders; small draughts of very cold water; or little lumps of ice, as recommended by Broussais, were followed, in most cases, by an abatement of the gastric irritability and vomiting. It is to this stage of the malady and not that of collapse, that the refrigorant treatment seems to me to be adapted.

In some instances, the most alarming irritability of stomach was subdued by starch injections with laudanum. Dr. Rives mentioned to me a striking case of this kind.

But the chief reliance, at last, was on calomel and opium or calomel alone. To be successful, it was necessary to administer them, especially the last, in large doses, and in powder with sugar, so as to promote their rapid diffusion over the surface of the stomach. There is not, I presume, a physician, in Cincinnati, who cannot testify to the efficacy of this practice. It was worth every other therapeutic means, both external and internal. The most violent vomiting would cease, whenever the stomach could be brought under the influence of this compound, or of the calomel uncombined; and a speedy return of the suspended secretions of the liver and skin, generally, followed; after which the patient commonly recovered.

Trials of opium alone, were sometimes made, or of the salts of morphia, or of laudanum, with ammoniated alcohol, or sulphuric ether, or the aromatic tinctures; but, I think, they were not found so beneficial, in allaying the irritability of the stomach, as calomel and opium, or even calomel, only, which, indeed, often succeeded better than the compound.

When called in, immediately on the access of the vomiting, we could often succeed with these means in arresting the disease, but our failures were not a few; and if the vomiting were suffered to continue for some hours, the utmost effort was too often unavailing, and the disease passed into the third stage —that of Collapse.

Of the treatment in this stage, what can I say? Certainly nothing either new or satisfactory. In Cincinnati, as in all the earth besides, a great majority of those who sunk into collapse,

inevitably perished. The methods adopted here were such as had been recommended, in places where the Epidemic had previously prevailed, but their effects were such, that one is at a loss to know, for what reason they *were* recommended.

I saw every practicable mode of inward and outward stimulation employed, with but little benefit. I should rather say, that all kinds of *stimulants* were *applied*, for in reality but little *stimulation*, was in general *excited*. The skin, it is true, was often reddened under our rubefacients. But no sympathies either continuous, contiguous, or remote, to quote the language of Mr. John Hunter, were, in many cases established; and the patient continued to sink as rapidly, perhaps, as if nothing had been done. There *were* cases, however, in which the descent of the vital powers was arrested by these means, and life apparently preserved.

The mustard emetic was often administered for this, and proved, I think, one of the best remedies. In one case, attended by Mr. Wood, one of my most ingenious pupils, I advised an emetic of opium and tartar emetic; it operated, but the patient died.

In this case and another, I advised injections of hot water, as practised by some of the Sunderland physicians; but was disappointed in their effects.

To a patient of Dr. Walker, one of our young physicians, who saw much of the disease, the cold affusion was applied, at my suggestion. When the buckets of water were dashed on, the patient shivered, groaned, and writhed under it, evincing a sensibility to its impress, but no glow of heat, or reaction of the heart, followed its application.

External heat appeared to be useful in many cases; but it was only when the patient was quiet that it could be successfully applied. I did not use the warm bath, nor the hot air or vapour bath. The latter was employed by some physicians; but, as far as I have been able to learn, with no very beneficial effect.

Blood-letting was employed in a number of cases, but seemed of little service.

Opium, I think, was generally found injurious, or, at least, useless, in this stage, whether given alone or in combination; and was, I believe, but little employed.

The administration of pellets of ice, on which Broussais seems almost exclusively to have relied, was, as far as I know, but little practised in this stage of the malady, partly, I presume, from a want of faith in the alledged results of that practice. For myself, I must say that the reports of its efficacy, in the practice of that celebrated physician, are somewhat incredible, and require confirmation. Regarding the disease as a gastro-enteritis, it is easy to perceive that much of preconceived opinion might have blended itself with the results of his clinical observations, and vitiated their correctness.

But *is* the disease an inflammation of the mucous membrane of the stomach and bowels? If so, it must be one of the most violent kind; and still for its cure, even Dr. Broussais does not venture to prescribe copious and repeated blood-letting; although that is the appropriate remedy for such an inflammation. Further, the same distinguished physician, after condemning the stimulant treatment in the stage of collapse, admits that it is better than *no* treatment; notwithstanding it is directly calculated to aggravate the inflammation! In all this there seems to be some mystery; and one cannot but suspect that this eminent pathologist, has found some difficulty in compelling this anomalous Epidemic to wear the shackles of his gastro-enteritic hypothesis. The opinion of the French Academy, that it is a catarrhal, rather than an inflammatory affection of the mucous membrane of the stomach and bowels, seems to quadrate much better with the facts.

I have been favoured with a letter from the respectable Dr. Henry Bronson, of Albany, written after he had witnessed many fatal cases of Cholera, both on the St. Lawrence and the Hudson, in which he observes, that a great number of different and *opposite* means have been found to rescue those who had sunk into collapse; and, that in attempting to determine what was common to the whole, in their *modus operandi*, one can discover nothing but that of their making a *strong impression on the system*—im-

parting to it, to speak figuratively, a kind of concussion, by which the torpid and sinking energies of the system are aroused, and the organs again put into action. I am disposed to think, that a more definite *rationale* of our treatment of this stage cannot be given in the present state of the sciences.

It must be admitted, however, that when, from a failure in the powers of the heart, the blood is not impelled to the distant parts of the body, but accumulates in the organs of the cranium, chest, and abdomen, or in some of them, that the phenomena of collapse will vary with the seat of the congestion; and that the means of cure should likewise vary. Thus, if the portal viscera be engorged, injections of hot water medicated, would be proper, and large doses of stimulating cathartics; or a mustard emetic; if the lungs and cavities of the heart are its special seat, blood-letting and antimonials might do good; and if the brain is specially engorged, as I saw in a patient of Dr. Woodward, who labored under profound apoplectic stupor, the loss of blood, in copious quantities, would seem to be the best, if not the only efficient remedy; but still, in that case it failed. The fact is, that those organic congestions, whether seated in the sinuses of the brain, the coronary and pulmonary vessels, or the portal circle, are but secondary effects; and if they could be removed by therapeutic efforts, it would by no means follow, that the patient would recover; for the debility of the circulatory apparatus, which occasioned them, might, and indeed generally does, remain, and continue to increase till the movements of the smitten and enfeebled heart entirely cease.

Of the consecutive fever, for a reason that will presently appear, I saw so little, that I will not venture to say any thing concerning it; except that nothing new, as far as I have heard, was employed by any of our physicians.

V. Quackery in the Treatment.

It would be wrong to bring this history to a close, without referring to the Steam, or Thompsonian practice, as applied to the cure of the Epidemic. The physicians of the South know but

little of this quackery from observation, but as an account of it was published in a former number of this Journal, they cannot be ignorant, that it consists chiefly in the administration of emetics of the *lobelia inflata*, and the subsequent use of concentrated tinctures of Cayenne pepper, myrrh and other stimulants, with the application of external heat, and a total abjuration of the lancet, opium, and calomel! Considered, therefore, in reference both to what it employs and what it rejects, it is a powerful practice, and must necessarily do either good or harm. That it sometimes did the former, cannot be denied; but I am satisfied that it much oftener perpetrated the latter. Indeed, I have heard of many cases in which it was manifestly prejudicial, and, firmly believe, that it was often fatal, where a discriminating and scientific practice might have succeeded. Still it has been boldly asserted, and unblushingly published to the world, that this practice was found, in Cincinnati, to be more successful than that of the regular members of the profession! Was the working with Thompson's patent, *confined* to illiterate men, who are too indolent to pursue an honest occupation for a livelihood, this notice would be less requisite; but when we discover among its advocates a number of respectable and intelligent citizens, such as members of the Bar and Trustees of our Medical College; when we see a regular Journal, established for sounding forth its praises, and find reputable booksellers, interested in the distribution of such a work, by which worthy, but ignorant and credulous people, are deluded into a false confidence, and the partition-wall between science and empyricism broken down; it is the duty of the former to assert its claims, and maintain its dignity. This is due, not merely to its own character, but to the interests of the community; and, as far as this Journal is able, will at all convenient times be done—whatever may be the apathy of some who ought to speak out; or the absurd preference of others, for a practice founded on no knowledge of the animal economy, over that, which rests on the collective experience of all ages and all nations.

VI. Conclusion.

In concluding, I must again speak of myself. It is necessary to tell the distant reader (in this region every body knows the fact) that after having been abused for announcing the existence of the Epidemic, and warning the people to be on their guard, I was subsequently calumniated with the extremest virulence, and the greatest injustice. In all the surrounding country it was reported, that I saw but little of the Epidemic, for that, having lost *nearly* all my patients, I had, in fear and discouragement, retired from the scene of action, soon after the disease made its appearance; and feigning sickness, continued in seclusion till the danger was over.

I cannot suppose that any respectable member of the Profession, who may read these pages, will object to my stating a few facts, in contradiction to calumnies so unfounded, and so degrading to my professional and moral character.

I declare, then, that as far back as the 28th of September, I had a most violent case of Epidemic Cholera; but, as the patient recovered, I did not enumerate it among those which ushered in the Epidemic; and that until the 16th of October, a period of *nineteen days*, I was in the midst of those who laboured under it, giving incessant advice, both as an attending and a consulting physician. That from making almost daily publications on the means of prevention and cure, a great number of persons, whom I do not attend in ordinary, were attracted to me, thus affording me ample opportunities of seeing the disease in all its varieties; that throughout the whole, my exertions, both of body and mind, were unremitting; that I got but little sleep at night, or rest by day, but was kept in a state of continual action and excitement; that these causes, at length produced an inflammatory affection of the brain, from which I had suffered several times before, which required the loss of two quarts of blood, under the direction of several respectable medical friends, and confined me till in November; that from the beginning, it was attended with a few symptoms of the Epidemic, as was, indeed, every kind of

illness, and that in its decline, these became more numerous, and protracted my confinement till the Epidemic had ceased. Now, during the whole period of nineteen days, through the last ten of which the disease was extensively and fatally prevalent, as the bills of mortality have shown, I lost but *three* patients. One of these sunk down in his yard, having neglected the early symptoms, and I saw him but *once*, from the great press of earlier engagements. The second was a gentleman 76 years of age, who had laboured under chronic diarrhœa from February, and had, twice during the summer, been expected to die of that malady. He was, of course one of the first attacked, but got so well as to go abroad. From indulgences in diet and imprudent exposure, he relapsed. He refused to take calomel; and, indeed, anticipating that he would become a victim to the Epidemic, was averse to medical assistance, and expired without being subjected to the treatment which, at that time, I was, both in private and public, recommending to others. The third and last patient whom I lost, was a lady, in whom the disease appeared in the form of hysteria, succeeded by fever, without any of the ordinary symptoms of Cholera. I saw her before day, on Sunday morning, and not, again, till Monday forenoon, when she still had no symptoms of the Epidemic. At eleven the following night, I was summoned to her a third time, and found that vomiting, coldness, and collapse, had suddenly supervened, and she expired early the next morning. She was visited, oftener than I visited her, by another gentleman, whose extensive practice in the Epidemic was at least as successful as that of any other physician in the city. THESE ARE ALL THE PATIENTS I LOST; IF THERE ARE ANY OTHERS THEY CAN BE POINTED OUT BY MY TRADUCERS.

Cincinnati, December 1*st*, 1832.

ART. II.—*Extraordinary Case of Protracted Vomiting, in which Life was sustained for an unusual length of time without Food.* Communicated by DANIEL SEXTON, M. D., of New Harmony,

I was requested on the 17th of October, 1829, to visit Mrs. L. L., who had been for some time declining in health. For five weeks she had been confined to her bed, vomiting frequently, and unable to retain any nourishment; life having been preserved in the mean time, by the occasional administration of a nutritive enema. She was much emaciated, although the countenance retained considerable vivacity. The pulse was weak, but without much disturbance, the skin of a natural temperature.

To allay the vomiting, I advised the following combination:

Aqua Ammoniæ,
Laudanum aa. ozj.
Oil of Cinnamon, gtt. viii.

Fifteen drops on a lump of loaf sugar, to be taken into the mouth and swallowed gradually. For a short time after taking the first dose, she expressed great satisfaction at the relief it produced, but on visiting her a few hours afterward, she informed me, that like every thing else she took, it had been followed by distressing vomiting, and had produced great gastric distress.

Having ascertained from her husband that a few teaspoonfuls of brandy which she had taken some days before, had produced temporary relief, and remained longer upon the stomach than any thing else she had taken, I recommended it to be tried in larger quantities, and in conjunction with it, to rub the spine with laudanum. and apply an opium plaster to the stomach. This plan was adopted, and continued until the morning of the 19th, when it was ascertained that no reliance could be placed upon it.

She was now much worse, mouth dry, tongue covered with dark crust, and the skin warmer than natural, and her life was despaired of by all that saw her. I now proposed to her husband the use of crude mercury, and with his assent gave an ounce of

it, apparently, with an immediate good effect. A second dose was administered in the course of the day, the good effect of which was not so apparent. The quick silver came away by stool in minute globules in the course of three or four days.

Several other remedies were tried in the course of this and the following day, every thing failing to give more than a temporary relief to the vomiting, and her system still sinking. The Spts. of Turpentine, in doses of a dram, mixed with mucilage, appeared for a time to relieve her, astonishingly, but soon failed to produce any influence. Supposing her to be dying, at 2 o'clock in the morning of the 21st, I gave her 1 1-2 grains of opium, and left without the expectation of again seeing her alive. However, to my great surprise, on the morning of the next day, she was found to be much better. In the evening she took an enema which brought away dark fœtid evacuations, and from this time she began to recover rapidly, and by the 23d, considered herself out of danger.

She had now lived for six weeks without food, and her body formed the most complete skeleton that could be conceived consistently with the continuance of life, the limbs appearing to be held together by the ligaments and integuments alone. Her intellectual faculties, however, were unimpaired, and the love of life undiminished.

We now gave her porter, wine, and sago in small quantities, with, occasionally, a little chicken soups thickened with barley. Upon this diet she continued to recover until the 3d of November. At this time it became necessary to remove her to the house of a neighbor, in consequence of the indisposition of her husband rendering him unable to attend upon her. She was borne upon a litter, supported by four men, when the unusual motion brought on a return of the vomiting, which continued for three days at protracted intervals. At the expiration of this time, in consequence of some imprudence in diet, it returned with great violence, threatening to prostrate her immediately.

Other measures having been ineffectual in relieving her, I resorted to the use of belladonna. One grain divided into four

pills, one of which to be taken every six hours. These were continued until five grains were taken, with the effect of keeping the stomach perfectly composed. At the expiration of this time the belladonna began to manifest its constitutional effects upon the system, it was discontinued for 36 hours, when upon some indications of a return of the vomiting, two additional doses of the belladonna were taken, which relieved it entirely.

From this time her recovery was slow and gradual, but uninterrupted. Some difficulty was experienced in restoring a regular condition of the bowels, but by the aid of injections and laxatives this was brought about, and a healthy state of all the secretions established.

About the first of December, after sitting up so long as to produce fatigue, she complained of a disagreeable sensation of pricking over the body, similar to that arising from pressure upon a nerve, and during the two or three days following, this sensation increased to such a degree of intensity in the hands and feet, as occasionally, to produce a temporary delirium. It was very much mitigated by the use of cider and water, but, for many days it returned about two hours after eating, accompanied with an unpleasant sense of burning. A local application of brandy to the hands and feet gave very great relief.

By spring, her health and strength were perfectly restored, except some inability of using the lower extremities, which gradually yielded to a system of regular exercise.

ART. III.—*A case of Cholera, combined with symptoms of Remittent Fever.* By JAMES C. FINLEY; M. D.

On Monday, the 14th of October I was requested by L. S., a button-maker, to prescribe for a diarrhœa, under which he had been labouring for some days. I gave him two pills of opium and calomel, one grain of the former to five of the latter, with

directions to take one immediately, the other in the afternoon, and in the evening, to take a dose of the compound syrup of rhubarb.

On the 16th I was sent for early in the morning, and found that the syrup of rhubarb, taken on the afternoon before, had operated actively, producing copious serous evacuations. He was now very sick at the stomach, vomiting frequently, and discharging from the bowels often, though not very copiously, the *rice-water* discharges. The face was sunken not livid, but of a smoky complexion, easily associated in the mind with the appearance of the sun in Indian summer. An emetic, of three tea-spoonsful of the flour of mustard, in a half pint of warm water, was immediately administered, which, after emptying the stomach, relieved the nausea and diminished the catharsis, a large sinapism was applied over the abdomen, and warm bricks and frictions assiduously applied to the extremities; and brandy toddy, for which he had a strong instinctive appetite, was administered in as large doses as his stomach would bear, and a pill, of calomel 5 grs. opium 1 gr. was given every hour until reaction took place.

These means, after a lapse of several hours, being followed by no alleviation in the symptoms, a vein was opened in the arm. The blood flowed from the arm of the usual color of venous blood, but after a few ounces were lost, became of a scarlet color. After the loss of about 6 ounces, the pulse sunk, and the vein was stopped. After the bleeding he was evidently worse; the pulse weaker, and the restlessness increased. Cupping was now resorted to. Several tumblers were placed over his chest and abdomen, and renewed at short intervals. At about 2 o'clock, P. M, the system began to react, the pulse became fuller, the skin warmer, and he passed, comparatively, a comfortable night. About 5 o'clock on the next morning, however, the symptoms of depression again returned, the rice-water discharges, which had only occurrred at long intervals during the preceding afternoon and night, became more frequent, the countenance became more ghastly, and the symptoms, in every respect, more unfavourable than on the day before

At noon Dr. Staughton saw him with me, and recommended a continuance of the same treatment. Reaction again took place about the same time, and the symptoms during the afternoon and evening were not materially different from those of the preceding day. On the following morning, however, at about the same hour, the symptoms of depression again returned. At the suggestion of Dr. Staughton, 15 grains of quinine were taken in the course of the morning, in three doses. Doubtful of the necessity or propriety of using such a quantity of brandy, good Madeira wine was substituted for it, of which, in the course of six hours, he drank nearly a quart. It did not, however, appear to supply the necessary stimulus, and we supposed it necessary to again recur to the brandy. The depression on this day was more alarming than on the preceding days, but when reaction took place it assumed a more satisfactory and decided character. Great pains were taken on the following day to guard against the periodical depression, but it did not recur. The restlessness and the jactitation, as well as the desire for the brandy, continued during this and the following day. We now, for the brandy, by degrees substituted porter, for which he had a strong desire, and accommodating his diet to his increasing strength, he soon regained his health, and returned to his ordinary business.

On the afternoon of the third day we derived great benefit, from the administration of pills of assafœtida, which were given, by the advice of Dr. Staughton. The uncomfortable distension, arising from flatulence, and the restlessness and jactitation, were more relieved by it, than by any other remedy that he had taken in the course of his disease.

Mr. S. is a man of strictly temperate habits, and therefore the great quantity of brandy which he consumed was the more remarkable. He called for it incessantly, both in the stage of depression and reaction, and the quantity consumed was not less than a quart in twenty-four hours, for four days. Whether this was a healthy or a morbid appetite, I pretend not to decide. I did not, however, consider it safe to neglect the indication of treatment which it held out.

After the second day he also expressed a strong desire for porter. It was at length given to him, and with a good effect. Since that time I have met with another case, in a confirmed toper, who revolted at the bare mention of brandy, but who eagerly called for porter. As soon as good London porter could be procured it was given to him, in quantities suited to the irritability of his stomach, and with a most admirable effect. The retching and jactitation, which were very distressing, were relieved almost immediately.

In the case which we are describing, the bile began to appear in the discharges on the afternoon of the second day, and continued to increase until convalescence was established. He had had, before this, one period of reaction lasting more than 12 hours; and afterwards, a stage of depression followed, more severe than any that had gone before. The prudent physician will not, therefore, be disposed to relax his exertions on account of the appearance of this symptom of convalescence. In one of our patients a relapse took place, and the patient sunk under a dark bilious diarrhœa; while in another, on the contrary, there was no appearance of bile in the discharges, until four days after convalescence was decidedly established.

ART. IV.—*Notices of Scarlet Fever in a township of Montgomery County, near Cincinnati, in a letter to Dr. Drake.* By GEORGE BRANCH, M. D.

Dear Sir,—I have drawn up and shall send you a few imperfect observations, on the Scarlet Fever, as it appeared in Montgomery and its vicinity. In doing so I am not certain that any thing original will be offered: but, to say the least, it is a portion of the medical history of the west, and perhaps may disprove or confirm opinions already extant.

With regard to the cause of the disease I can say nothing

very definite. If its origin was not atmospheric I cannot account for it. Sometimes one or two among half a dozen children, were attacked, while the remainder escaped. It appeared in those who had not been exposed to the disease in others—and those who had been exposed did not often take it.

I observed that most of the attacks occurred immediately after rains, which cleared up warm, with a close and confined atmosphere. The Epidemic was not entirely confined to children, for I saw one adult who had the disease completely developed;--the true scarlet eruption—the anginose affection—and the intense heat of the skin were all present. Many others had the anginose affection only.

Some of the cases were very mild, being attended with a moderate degree of fever—swelling of the parotid glands and tonsils—a thickly coated tongue—no eruption—finishing its course in a week. Others were attended with a scarlet eruption, great heat and itching of the skin, and a very sore throat; the fever generally continuing from ten to fifteen days, and desquamation of the cuticle following the decline of the eruption. Sometimes the efflorescence was not diffused over the body, but came out in irregular patches on different parts. It frequently disappeared and reappeared at uncertain times. In most of the cases the arterial excitement was very strongly developed. During the stage of excitement, head-ache and delirium were common symptoms. In some cases great præcordial oppression was present. From the commencement of the fever a dull pain with stiffness was felt under the ears—under the angles of the jaw, and in the muscles of the neck. At this time, the tonsils, fauces, palate, and uvula were slightly swelled and red. In the course of the disease the voice was hoarse, deglutition painful, and the breathing difficult. When the disease was severe, ulcerations formed in the throat, which were converted into sloughs, that separated on the decline of the fever. In one case the sloughs enlarged—changed to a brown color, and discharged a sanious fluid: the glands of the neck being swelled enormously.

Sequela.—Various troublesome disorders followed the subsidence of the fever. Dropsical effusions were the most common. Indeed I saw but very few cases that recovered without swelling of the extremities. Some in a few weeks from the decline of the fever, would pass into a torpid state, with great disposition to sleep:—no appetite—slight febrile attacks in the afternoon—moderate anasarca—urine dark in color, and depositing a sediment which resembled coal-dust—bowels torpid, requiring large cathartic doses to move them—the skin and tunica albuginea deeply tinged with yellow. These cases were very lingering, but the patients recovered under the use of brisk mercurial purges. In some a discharge of pus from the ear with partial deafness followed. For several weeks, exposure to cold reproduced glandular swellings.

Treatment. Most of the cases required a prompt anti-phlogistic course. Bleeding—antimonial vomits, and afterwards, tartar emetic in broken doses, to curb the action of the heart and arteries—blisters, if much glandular tumefaction existed—gargles of vitriolic acid, and a solution of chloride of lime—cathartics and aperients, and if much heat and itching of the skin, cold effusions, were the remedies which seemed most beneficial.

The dropsies which came on after the decline of the fever, were connected with a phlogistic state of the system. The pulse was quick, sharp and frequent—the skin dry and harsh, and warmer than natural—bowels torpid and urine high-colored and small in quantity. Here purgatives, diuretics—refrigerant diaphoretics, and the warm bath, were used with manifest advantage.

I will relate a case which had some peculiarities. A child, three or four years old, when I first saw it, thirty hours after the attack, had a pulse at the wrist scarcely perceptible—the eruption pale in color—the extremities cold—the upper surface of the tongue, fauces and tonsils of a deep red—the tongue covered with a brown fur, with the red and enlarged papillæ showing through it—the eyes dull, and the respiration oppress-

ed. Stimulants, both external and internal—warm ptizans—calomel in large doses, and stimulating enemata, succeeded in restoring the circulation to the surface and extremities. On the third day, ash-colored ulcers appeared on the tongue and in the fauces; and the glands of the neck were much tumefied, the arterial action and heat of the surface moderate. On the fifth day, the ulcers were converted into black and fetid sloughs. The glandular swellings continued until they reached the orbits of the eyes—the ears—the clavicles, and crossed the trachea; both the breathing and deglutition being rendered difficult. On the seventh day, the swelling began to decline—the cuticle to desquamate—the pulse became more regular and fuller, and every thing seemed for the better until the tenth day, when the little patient manifested a strong disposition to sleep. The following night I was called in haste, and found the breathing laborious and difficult—the face and lips of a dark livid tinge—pulse small, frequent, and intermitting—deglutition very difficult—involuntary stools—extremities cold—tongue covered with a dry and black fur—some of the sloughs in the fauces had separated and left red ulcerated surfaces, which again turned black. Respiration soon became quick and short, succeeded by stupor, in which the little patient expired. In three or four hours after death, putrefaction followed.

You are at liberty to make such use of the foregoing observations as you may deem proper. They are copied from notes which were taken during the progress of the disease, and were only intended to be a history of facts.

Your obliged friend and servant,

GEO. W. BRANCH.

DANIEL DRAKE, M. D.

Reviews and Bibliographical Notices.

Art. V.—*A Treatise on Dislocations and Fractures of the Joints.* By Sir Astley Cooper, Bart. F. R. S., Sergeant Surgeon to the King, &c. &c. To which are added the Notes and References to the first American Edition. By John D. Godman, M. D., &c.

It must always be with peculiar pleasure that the student or practitioner of medicine sits down to the perusal of a work like this of Sir Astley Cooper. An individual of great and practical mind, with opportunities for observation unequalled, with an ambition of a high order, yet chastened down to its appropriate sphere of honorable professional ambition, brings all the learning of the past, and all the experience of the present age, to assist him in constructing a treatise upon one of the most important departments of Surgery, which will leave nothing for future historians to complete, either in the description of the possible varieties of disease, or in the invention of remedial measures. Such a work we consider the *Treatise on the Dislocations and Fractures of the Joints.*

The first chapter is of course devoted to *Dislocations in general.* In enumerating the various sources of difficulty which prevent the surgeon from forming a satisfactory diagnosis in cases of dislocation, Sir Astley lays particular stress upon the importance of a knowledge of the anatomy of the Joints, and comments with great justice upon the almost universal practice among students after studying with great care and accuracy the arrangement of the muscular, vascular, and nervous systems, to pass by the structure of the joints as an affair of little moment. From this carelessness originate frequent mistakes; for the dislocations of the elbow, the shoulder, or the hip, are frequently

not to be detected without accurate anatomical knowledge. This neglect is the more inexcusable, inasmuch as the principal part of surgical practice consists in injuries of this nature. It is therefore of the utmost importance "that the form of the extremities of the bones, their mode of articulation, the ligaments by which they are connected, and the direction in which their most powerful muscles act, should be well understood."

After dislocation, the limb generally assumes a determinate position—in consequence of the action of the muscles—and after a short interval, it becomes so fixed in its position by the tonic contraction of the muscles, that it is moved with great difficulty.

The length of the limb is altered, and it is generally shortened; sometimes, however, it is lengthened, and then the muscles, being put very much upon the stretch, are lacerated, and an effusion of blood, in proportion to the extent of the injury, takes place, increasing very much the difficulty of diagnosis.

The pressure of the head of the bone frequently produces very troublesome effects—from pressing upon a large nerve, for instance, paralysis or severe pain may result; and a dislocated clavicle has been known to endanger life by obstructing the œsophagus.

A sensation of crepitus is sometimes experienced after dislocation, from the effusion of adhesive matter into the joint and bursæ—"a circumstance of which every practitioner ought to be aware." The very fact of the practitioner being aware of this circumstance seems occasionally to be attended with its inconveniences, as if it were necessary that ignorance should have something to keep it in countenance. It happened once with ourselves to be very much mortified by having a distinguished surgeon pronounce, that the crepitus by which we recognized a fracture of the fibula near the knee, was merely the rubbing of the bursæ. The subsidence of the swelling, however, and the inability of the old patient to use the limb for two years, convinced both patient and physician of the existence of fracture.

Dissection shows the capsular ligament to be lacerated, to a very considerable extent, and the peculiar ligaments of the joint

to be torn through. The tendon of the biceps which serves the double purpose of ligament and tendon, is not lacerated when the arm is dislocated into the axilla, the tendon of the subscapularis, however, is, and upon the extent of the laceration very much depends the facility of reduction.

The dissection of old dislocations frequently shows so wonderful a power of accommodation to the necessities of the case, that we shall extract Sir Astley's remarks upon the subject.

"*Dissections of old Dislocations, &c.*—The appearance of joints which have long been dislocated, depends not only on the length of time that has elapsed from the accident, but also on the structure upon which the head of the dislocated bone is thrown; for, if it be found embedded in muscle, its articular cartilage remains, and a new capsular ligament forms around it, which does not adhere to its cartilaginous surface. This ligament, in dislocations of the femur, contains within it the head of the bone, with the lacerated portion of the ligamentum teres united to it. In these instances, the bones themselves undergo little change. The capsular ligament is formed from the surrounding cellular tissue; which being pressed upon by the head of the bone, becomes inflamed, thickened, and condensed. By this means a substance is produced somewhat less dense than original ligament, but still possessing sufficient firmness to bear considerable pressure, and furnish some degree of support.

Head of the bone resting on another bone, &c.—But if the head of the dislocated bone be placed on the surface of another bone, or upon a thin muscle over it, that muscle becomes absorbed, and the bone undergoes a remarkable change; thus it is found, if the dislocation be not reduced, that both the ball and the bone that receives it, are changed in their form. The pressure of the head of the bone produces absorption of the periosteum, and of the articular cartilaginous surface of the head of the bone; a smooth hollow surface is formed, and the ball becomes altered in its shape to adapt it to its new surface; and whilst this absorption proceeds upon the part on which the head of the bone rests, an ossific deposite takes place around it from the periosteum, which is there irritated, but not absorbed. By the deposition of this bony matter between the periosteum and the original bone, a deep cup is formed to receive the head of the bone, and perhaps no instances can be adduced which more strongly mark the powers of nature in changing the form of parts to accommodate them to new circumstances, than these effects of dislocation.

The new cup which is thus formed, sometimes so completely surrounds the neck of the bone, as to prevent its being separated without fracture, and the socket is smoothed upon its internal surface, so as to have no projecting parts, which can interrupt the motion of the bone in its new situation.

The muscles losing their action, become diminished in length, in proportion to the displacement of the bone towards their origin; and if the dislocation has been long unreduced, they lose their flexibility, and tear rather than yield to extension."

Dislocations, although generally produced by violence, sometimes result from other causes—from *relaxation of the ligaments*; this occurs most frequently in the shoulder, in the patella, and in rare cases in the hip. Individuals are frequently met with who can dislocate the shoulder at pleasure.

Dislocations may arise from paralysis; especially in those joints in which the structure of the articulation is principally preserved by the action of the muscles. They are produced also by ulceration.

Fracture and dislocation frequently result from the same injury, and indeed such is the structure of some of the joints, that the latter can scarcely take place without the former, as in the ancle joint, for instance. When these two accidents are combined, it is generally necessary, after firmly securing the limb by splints, to reduce the dislocation without loss of time, it cannot afterward be done without endangering the union of the bone.

Compound dislocations are attended with great constitutional irritation and consequent danger to life.

"When a joint is opened, inflammation of the lacerated ligaments and synovial surface speedily succeeds; in a few hours suppuration begins, and granulations arise from the surface of the secreting membrane; which, being of the mucous kind, is more disposed to the suppurative, than to the adhesive inflammation. But the same process does not immediately ensue upon the extremity of the bone, because it is covered by the articular cartilage. This cartilage, before the cavity fills with granulations, becomes absorbed, by an ulcerative process instituted on the ends of the bones, but sometimes beginning from the synovial surface. The bone inflames, the cartilage becomes ulcerated, numerous abscesses are formed in different parts of the joint, and at length granulations spring from the extremities of the bones deprived of their cartilages, and fill up the cavity; generally these granulations become ossified, and anchylosis succeeds; but sometimes they remain of a softer texture, and some degree of motion in the joint is gradually regained.

This process of filling up joints requires great general as well as local efforts; a high degree of irritation is produced; and if the constitution be weak, the patient, to preserve his life, is obliged to submit to amputation.

Injury to muscles, blood-vessels, etc.—In addition to the above circumstances, the violence necessarily inflicted on the parts in compound dislocations, the injury of the muscles and tendons, and the laceration of blood-vessels, necessarily lead to more important and dangerous consequences than those which follow simple dislocations."

Sir Astley Cooper has seen two instances of this accident at the shoulder, and one at the knee—at the elbow, ancle, and wrist it frequently occurs.

It is not necessary perhaps to mention, that the muscles constitute so great a preservative against dislocation, that it generally takes place when they are unprepared to resist; or, in consequence of their sudden and convulsive action when the limb is in an untoward position.

Dislocations are rare in old persons—the bones from their brittleness rather giving way. They are also comparatively rare in the young—the epiphyses generally yielding.

Obstacles to the Reduction of a Dislocated Limb. These may exist in the structure of the joint; such as arises from the lip of the bone constituting the socket of the thigh, or from the head of the bone being much larger than the cervix, as is the case with the radius.

A more serious source of difficulty arises from the ligaments which surround the joint. The capsular ligaments from their delicacy, can have but little tendency either to prevent a dislocation, or to resist its reduction. The joints, however, are provided with ligaments accommodated to the nature and extent of their motions, and the injuries to which they are exposed, and their structure is still further strengthened by the tendons of the muscles being inserted in such manner as to serve the purpose of ligaments. These ligaments must of necessity generally be lacerated before dislocation can take place. They do, however, occasionally escape laceration, at the time the bone slips from its socket, and afterward, present serious difficulties in the way of its reduction.

The contraction of the muscles offers the principal obstacle to reduction. As soon as dislocation takes place, the muscles contract, to accommodate themselves to the new position of the bone, and this contraction continues until the structure of the muscle becomes permanently altered, by a deposition of dense fibrous matter. When force is applied to overcome this contraction, the muscles oppose a resistance proportioned to the length of time since the accident, and this resistance after a time becomes insurmountable.

In old dislocations, other difficulties occur. Adhesions form between the extremity of the bone and the surrounding parts—the socket becomes filled with adhesive matter, so that the bone, if reduced, would not remain in its original situation—and lastly, a new bony socket is sometimes formed, completely confining the head of the bone.

The means to be employed for the reduction of dislocations, are both constitutional and mechanical. Force alone is insufficient to overcome resistance of the muscles, since the degree of it necessary for the reduction of many dislocations would be liable to produce violence and injury. The constitutional means to be employed are those which cause relaxation of the muscles by producing a disposition to syncope—bleeding, the warm bath, and nausea. If bleeding is resorted to, it is scarcely necessary to inform the student, that it should be taken under such circumstances as will secure its full influence with as little expense to the system as possible. The blood should be taken, therefore, from a large orifice, while the patient is standing. Dr. Gibson thinks that a knowledge on the part of the patient of the intention of the surgeon to make him faint, makes the abstraction of a much greater quantity of blood necessary before the object is secured.

The *warm bath* is resorted to where circumstances connected with the general health of the patient render bleeding inadmissible. The temperature should be from 100 to 110, and, as the object is to relax the muscular system, should be continued until some degree of faintness is produced.

Nauseating doses of tartar emetic are frequently used for the purposes of diminishing the power of the muscles, but as this medicine is uncertain in its operation—frequently producing vomiting, which is both unnecessary and inconvenient, Sir Astley's custom is merely to use it in such a manner as to keep up the relaxation produced by the other remedies.

Opium, Sir Astley suggests, in large doses, might be useful. The relaxing effects of *tobacco* and of *intoxication by ardent spirits* have been successfully resorted to, but the practice is not likely to be generally followed.

In resorting to the necessary mechanical expedients, it is of the greatest consequence to have the bone in which the socket of the joint is placed, firmly fixed before extension is commenced; and the greater attention to this point is necessary in proportion to the mobility of this bone. One of the principal sources of difficulty in the reduction of a dislocated os humeri, arises from the mobility of the scapula. The joint being properly secured for the purpose of counter-extension, the extending power is to be applied gradually, so as rather to overcome the resistance of the muscles by fatigue than to overpower them by violence.

The Compound Pully for this purpose, where considerable force is necessary, has a great superiority over the action of assistants applied directly to the limb. Its effect may be gentle, long-continued, and completely under the control of the surgeon. The action of assistants, on the other hand, is necessarily irregular, sudden, and often ill-directed, and as their muscles are as liable to become fatigued as those of the patient, there is danger of their relaxing their efforts, perhaps at the very moment when the resistance is about to give way. Ambrose Parey was the first to use the pully. Most writers on Surgery since his time have adverted to them, but they have not duly appreciated their importance.

A relaxed condition of the stronger muscles, by a judicious position of the limb, is frequently of great importance, and in difficult cases, should always be consulted as far as practicable.

Should the extension be applied to the dislocated bone, or on the limb below? Mr. Boyer prefers the latter mode; Sir Astley, except in the case of a dislocation of the shoulder, prefers the former.

The influence of volition upon the muscles may be frequently turned to very good account, by causing the patient to make some muscular exertion, while the extension is kept up, the opposition of the muscles often ceases, and the bone slips into its place in a moment.

A great deal has been said about the length of time at which a dislocation may be reduced, and some surgeons in this country have acquired great eclat by successful attempts at reduction many months after the accident. As these accounts have been republished by most of the surgical writers in this country, in a manner calculated to excite sanguine expectations that are not likely to be very generally realised, it may not be improper to give the opinion of Sir Astley Cooper upon this subject.

"*Old dislocations not to be reduced.*—I believe that much mischief is produced by attempts to reduce dislocations of long duration in very muscular persons. I have seen great contusion of the integuments, laceration and bruises of muscles, tension of nerves, inducing an insensibility and paralysis of the hand, occasioned by an abortive attempt to reduce dislocation of the shoulder; so that the patient's condition has been rendered much worse than before. In such cases, even when the bone is replaced, it has often proved rather an evil than a benefit, from the violence of the extension.

In those instances in which the bone remains in the axilla, in dislocations of the shoulder, a serviceable limb and very extensive motions of it may be regained, although reduction has not been effected. Captain S——, who had dislocated his shoulder four years before, called to show me how much motion he had recovered, although the arm still remained unreduced.

Time for attempting reduction.—I am of opinion, that three months after the accident for the shoulder, and eight weeks for the hip, may be fixed as the period at which it would be imprudent to make the attempt at reduction, except in persons of extremely relaxed fibre, or of advanced age. At the same time, I am fully aware, that the shoulder has been reduced at a more distant period than that which I have mentioned; but, in most instances, the reduction has been attended with the results I have just been deprecating.

In cases of unreduced dislocation, the only course which the sur-

geon can adopt, after the inflammation which the injury produces has subsided, is, to advise motion of the limb, and friction of the injured part:—The former to produce a new cavity for the head of the bone, to assist in forming a new ligament, and to restore action to muscles, which they would otherwise lose by repose;—the latter, to produce absorption, and remove the swelling and adhesions which the accident has caused."

These views are confirmed by the bad success of several late attempts at reduction in this country, which have been recorded, and probably of many more which have not been recorded.

Particular Dislocations.—Dislocations of the hip-joint come first under the author's notice. Upon this subject he is very full and explicit, illustrating every possible variety of the accident, with its symptoms, diagnosis, consequences, &c., by numerous cases, but our limits do not permit us, at present, to examine this subject. To this is appended an account of the *fractures of the upper part of the thigh.*

This subject is one of very great importance, as well on account of the frequent occurrence of accidents of this kind, as from the difficulty which frequently exists of forming a diagnosis between fracture and dislocation.

These accidents, Sir Astley states, are much more numerous than dislocations; for while there are not received into the hospitals of Guy's and St. Thomas's (containing about nine hundred patients) more, upon an average, than two such dislocations in a year, the wards are seldom without an example of fracture of the upper part of the thigh-bone.

The result of the fracture will differ very much, according to its situation—a fact that is particularly deserving of the attention of the young surgeon. The varieties of the fracture may be classified in the following manner:—1. Those which occur through the neck of the bone, within the capsular ligament.—2, Through the neck of the bone, at its junction with the trochanter.—3. Through the trochanter.

Fractures within the capsular ligament, according to Sir Astley, are never united by osseous union. A great difference of opinion has prevailed among surgeons respecting the possibility of uniting fractures of the cervix femoris. Sir Astley has

attempted to reconcile the discrepancy, by proving that fractures within the ligament never unite, while those occurring without, heal, as under other circumstances. To this point he adduces a great body of evidence, and extends the principle to fractures of the patella, the olecranon, the condyles of the humerus, and of the coronoid process of the ulna—viz. that they unite only by ligament.

The fracture within the ligament occurs most frequently in women, on account of a peculiarity in their structure, which will be readily understood by every student of anatomy who has paid any attention to this subject.

It occurs also in those advanced in life. Out of between three and four hundred cases of fracture of the upper part of the thigh-bone, which Sir Astley has seen, but two cases of fracture within the ligament have occurred in persons under fifty years of age, and one of these was in a patient aged thirty-eight, who had an aneurism of the iliac artery. After this age dislocations seldom take place except in persons whose constitution is very robust.

The principles upon which this diversity is to be explained, are to be sought for,—first, In the general changes which the bones undergo, with the advance of age, by which their structure becomes lighter, softer, and more brittle;—secondly, In the peculiar change which takes place in the neck of the thigh-bone.

"Even the neck of the thigh-bone in aged persons is sometimes undergoing an interstitial absorption, by which it becomes shortened, altered in its angle with the shaft of the bone, and so changed in its form as to give an idea, upon a superficial view, that it has been the subject of fracture, thus leading persons into the erroneous supposition, that the bone has been partially broken and reunited; but it requires very little knowledge of anatomy to distinguish in the skeleton, the bone of advanced age from that of the middle period of life.

The neck of the thigh-bone in adult persons of middle age, has a close cancellated structure, with considerable thickness of the shell which covers it; but in old subjects, the cancellated structure of the shaft of the bone, which is formed of a course net-work, loaded with adipose matter, is often extended into the neck of the bone, and the shell which covers it becomes so thin, that when a section is made through the middle of the head and cervix, it is found diaphanous; of this I have several specimens. As the shell becomes thin, ossific

matter is deposited on the upper side of the cervix, opposite the edge of the acetabulum, and often a similar portion at its lower part, and thus the strength of the bone is in some degree preserved; this state may be frequently seen in old persons. Mr. Steel, of Berkhampstead, one of the most intelligent surgeons, and most respectable men I know, gave me the thigh-bone of a person thus altered, whose age was ninety-three.

When the absorption of the neck proceeds faster than the deposit on its surface, the bone breaks from the slightest causes, and this deposit wears so much the appearance of an united fracture, that it might be easily mistaken for it. Before the bone thus alters, we sometimes meet with a remarkable buttress shooting up from the shaft of the bone into its head, giving it additional support to that which it receives from the deposit of bone upon its external surface. But another change is also produced from disease, of which the following is the history, and which directly applies to the subject before us.

Old bed-ridden and fat persons, (generally females), are often brought into our dissecting-room with some of their bones broken (and more frequently the thigh-bone than any other) in being removed from the grave. If the cervix femoris of such persons be examined, it will be found that the head of the bone is sunken down upon its shaft, and that the neck of the thigh-bone is shortened, so that its head is in contact with the shaft of the bone opposite to the trochanter minor; and at the part at which the ligament is inserted into the neck of the bone, the phosphate of lime is absorbed, and a ligamento-cartilaginous substance occupies its place; either extending entirely through the neck of the bone, or partially, so that one section exhibits signs of it, and in another it is wanting. The bone, in some cases, is so soft and fragile, both in its trochanter and head, that it will scarcely bear the slightest handling; and the motion of the thigh-bones in the acetabulum is almost entirely lost, so that the persons must have had little use in their lower extremities.

This explanation will also account for the slight causes, by which this fracture is produced—a mis-step, or some other trifling accident.

The causes which Sir Astley assigns for the want of ossific union, are, 1. *The want of proper apposition.*—He thinks himself authorized, from much observation and from numerous experiments, to lay it down as a principle, that perfect union never takes place when the extremities of the broken bone are not in contact. When the broken extremities of a bone are separated entirely, either by the action of the muscles, or other causes, the deposit of osseous matter, which forms the callus, is very imperfect, and if they are partially in contact the deposit is very

abundant at the point of union, and less so at the other points. Now the tendency of the muscles in a fracture of this kind, is to keep the bones separated, in a manner, that it is impossible to prevent; and this tendency, when the capsular ligament is not torn, is still further promoted by the increased secretion of the synovia, which arises from the inflammation that now takes place, by which the capsule is so distended as to keep the ends of the bone asunder, until the inflammatory process has ceased, and the disposition to heal has subsided.

The principal cause, he thinks, 2. *is the want of action in the head of the bone.* The head of the bone is principally supplied by the vessels of the periosteum of the cervix. If, therefore, as is generally the case, the periosteum be torn when the fracture takes place, the circulation is necessarily very much interrupted, consequently no deposit of bone or cartilage takes place, but the deposit which does take place consists of ligamentous matter, covering the surface of the cancellated structure, with little patches, like ivory, on the head of the bone. The following description of the appearances on dissection, seem to confirm the author's views.

"*Dissection of this fracture.*—The appearances which are found on the dissection of these injuries are as follow:—the head of the bone remains in the acetabulum attached by the ligamentum teres. There are, upon parts of the head of the bone, very small white spots like ivory. The cervix is sometimes broken directly transversely, at others with obliquity. The cancellated structure of the broken surface of the head of the bone and of the cervix, is hollowed by the pressure of the neck attached to the trochanter, and consequent absorption; and this surface is sometimes partially coated with a ligamento-cartilaginous deposit. The cancelli are rendered firm and smooth by friction, as we see in other bones which rub upon each other when their articular cartilages are broken off. Portions of bone are formed or broken off, and these are found either attached by means of ligament, or floating loosely in the joint, covered by a ligamentous matter; but these pieces do not act as extraneous bodies, so as to excite inflammation, and thus produce their discharge, any more than those loose portions of bone covered by cartilage, which are found so frequently in the knee, and sometimes in the hip and elbow-joints. With respect to the neck of the bone which remains attached to the trochanter major, the most remarkable circumstance is, that it soon becomes in a great degree absorbed, only a small portion of it remaining; its surface is yellow, and extremely smooth, if the bones have rubbed against

each other. Some ossific disposition I have seen manifested around this small remaining part of the neck of the bone, and upon the trochanter major of the thigh-bone below it, in several examples of this fracture. We do not, however, observe the same process of union as in other bones, but a ligamentous instead of an ossific union.

The trochanter is drawn up, more or less, in different accidents; and in those cases in which it is very much elevated, I have known a considerable ossific deposit take place upon the body of the thigh-bone, between the trochanter major and the trochanter minor. When the bone has been macerated, its head is much lighter and more spongy than in the healthy state, excepting on those parts most exposed to friction, where it is rendered smooth by the attrition which gives it a polished surface."

The following are the principles laid down for distinguishing the different species of fracture of the thigh.

"*The fracture of the cervix within the capsule* is known, with very rare exceptions, by the very advanced age of the patient,—by its greater frequency in female than in male subjects,—by the absence of swelling and ecchymosis,—by the elevation and advance of the trochanter,—by the greater mobility of the joint, allowing flexion and extension, although with some pain, and resistance from muscles,—by a crepitus perceptible only on drawing down the limb to the same length with the other, and then rotating it,—by the pain felt at the trochanter minor,—by the small degree of constitutional irritation attending the accident,—by the slight causes which produce it,—and by the little local swelling or change of appearance which ensues.

Fractures of the cervix into the cancelli of the trochanter are known by the effusion of blood amidst the muscles,—by great swelling produced, and by ecchymosis, which appears soon after the accident,—by an unnaturally fixed state of the joint, so that flexion and extension cannot be performed,—by excessive pain on the least motion of the hip-joint, and upper part of the thigh-bone,—by a crepitus attending the least motion of the thigh-bone without drawing it down to the length of the other,—and by the inflammation, swelling, and constitutional irritation produced, which are frequently fatal.

The fracture of the trochanter major may be easily known by the separation of the bone at the part, so that the finger may be placed between the fractured portions,—by the distinct crepitus felt in putting the fingers on the trochanter when the knee is advanced, by inability of the upper portion of the trochanter to obey the motions of the lower, and of the shaft of the bone,—and when at the lower part of the trochanter, by great overlapping, distension, and exhuberant callus."

We give his opinion upon the proper position of the thigh when fracture takes place below the trochanter. The difficulty

in this case arises from the impossibility of preventing the iliacus, internus, and psoas muscles from drawing the upper portion of the bone upwards.

"To prevent this horrid distortion and imperfect union, two circumstances are to be strictly observed; the one is, to elevate the knee very much over the double inclined plane; and, the other, to place the patient in a sitting position, supporting him by pillows during the process of union. The degree of elevation of the body which is required will be about forty-five degrees, but it may be readily ascertained by observing the approximation of the fractured extremities of the bones; and this position is requisite for relaxing the psoas iliacus muscles, and thus preventing the elevation of the upper part of the bone. In no other manner can the great deformity I have described be prevented. When, by this posture, the extremities of the bones are brought into proper apposition, and all projection of its upper portion is removed, either the splints may be applied which are commonly used in fracture of the thigh-bone, or, what is better, a strong leathern belt, lined with some soft material, should, by means of several straps, be buckled around the limb, and be confined by means of a strap around the pelvis.

We shall close our account of this work with a review of the remarks upon compound dislocation of the ankle joint, in which the author has summed up the principles of treatment which should regulate our practice in similar injuries of the other joints.

The first symptom, after the exposure of the joint, is a profuse discharge of the synovia, increasing with the determination to the part which immediately takes place. The inflammation, in about five days, proceeds to suppuration, which, eventually, becomes very abundant. Ulceration of the cartilages succeeds, which sometimes proceeds so far as to lay the foundation for exfoliation of the extremities of the bones. When the cartilages are absorbed, granulations arise from the surface of the bones, and these inosculate, and fill the cavity between the extremities of the bones. Such is the general process. Sometimes, however, adhesive inflammation takes place, and the surfaces of the joints adhere without ulceration.

This inosculation of granulations, or adhesive inflammation, does not generally produce permanent stiffness of the joint, pro-

vided passive motion be commenced as soon as the cessation of the pain and inflammation will permit. Even if the structure of the joint is destroyed, a new articulating surface is formed, and the partial stiffness of the ankle which may result, is compensated by an increased mobility of the other joints of the tarsus.

The constitutional disturbance arising from this local inflammation runs very high, and if the local irritation be great, the nervous system is very much affected, and watchfulness, delirium, and subsultus tendinum, and sometimes tetanus, ensue.

Thirty years ago it was the practice to amputate the limb for this accident; but it is now well known that in the greater number of cases, this operation is unnecessary. Every extraneous matter, such as dirt, loose pieces of bone, &c. is to be carefully removed from the wound, and, if necessary for this purpose, the wound in the integuments is to be enlarged.

Reduction.—The mode of reducing the bone is, in other respects, similar to that which I have already described, when speaking of the simple dislocation; bending the leg upon the thigh, so as to relax the muscles before the extension is made. When the bone has been reduced, a piece of lint is to be dipped in the patient's blood, and applied wet over the wound, upon which the blood coagulates, and forms the most natural, and, as far as I have seen, the best covering for the wound. A many-tailed bandage is then applied, the portions of which should not be sown together, but passed under the leg, so that any one piece may be removed when it becomes stiff; and by fixing another to its end, the application may always be renewed without any disturbance to the limb: this bandage is to be kept constantly wet with spirits of wine and water. A hollow splint, with a foot-piece at right angles, is to be applied on the outer side of the leg, in the dislocation inwards, and the leg is to rest upon its outer side: but in the dislocation outwards, it is best to keep the limb upon the heel, with a splint and foot-piece both upon the outer and the inner side: and an aperture in the splint opposite to the wound."

Sir Astley is not very favourably disposed to blood-letting in this injury, thinking it important, as a general principle, to husband the strength for the great trial which the powers of life will have to undergo. And therefore, he thinks whatever is to be done, either in the way of bleeding or purging, should be done early after the accident, before adhesive inflammation has taken place. An opinion very different from that entertained by many

respectable surgeons, who think that where the inflammatory symptoms run high, the constitution is more impaired by the unrestrained course of inflammatory action, than by the loss of blood. In the greater number of the cases recorded in the present volume, blood-letting was seldom resorted to, to any extent. Irritation should be allayed by the spts. Mindereri and opiates, with occasionally a mild aperient.

"*Secondary treatment.*—If the patient complain of considerable pain in the part, in four or five days, the bandage may be raised to examine the wound; and if there be much inflammation, a corner of the lint should be lifted from the wound, to give vent to any matter which may be formed; but this ought to be done with great circumspection, as there is a danger of disturbing the adhesive process, if that be proceeding without suppuration. By this local treatment, it will every now and then happen that the wound will be closed by adhesion; but if in a few days it be not, and if suppuration take place, the matter should have an opportunity of escaping; and the lint being removed, simple dressing should be applied. After a week or ten days, if there be suppuration, with much surrounding inflammation, poultices should be applied upon the wound, leeching in its neighbourhood, and upon the limb at a distance, and the evaporating lotion should be still employed; but as soon as the inflammation is lessened, the poultices should be discontinued, as they encourage too much secretion, relax the blood-vessels of the part, so as to prevent the restorative process."

The practice has been often pursued of sawing off the end of the tibia before restoring the bone to its position. The following quotation presents a full view of the subject.

"*Sawing off the ends of the bones, &c.*—There is another mode of treatment in these accidents, which consists in sawing off the extremity of the tibia before the bone is returned into its natural situation; and the reasons which may be assigned for pursuing this practice are as follow.

Difficult reduction.—First. That there is in some cases much difficulty in the reduction of the tibia, and great violence must be employed to affect it.

Oblique fracture.—Secondly. The extremity of the bone is often broken obliquely, so that when reduced it will not remain upon the astralagus, but when the point is removed by the saw, it rests without difficulty upon that bone.

Spasms.—Thirdly. The spasmodic contractions of the muscles are much diminished by shortening the bone, as it throws them all into a state of relaxation; whereas, if the bone be reduced by violence when

the saw has not been used, the spasm of the limb will be sometimes very violent.

Local irritation diminished.—Fourthly. The local irritation is much diminished by the greater ease with which adhesion of the sawn extremity of the bone to the parts to which it is applied; for it is a mistake to suppose that the sawn end of the bone will not adhere; the contrary is seen in amputation in sawing off a bone in exostosis, and in the union by adhesion of compound fractures; and that adhesive matter can be thrown out upon cartilaginous surfaces is known to every person who has dissected a diseased joint; it is thus that the end of the tibia adheres to the surface of the astralagus.

Suppuration and ulceration lessened.—Fifthly. When suppuration does occur it is much diminished, and a considerable part of the ulcerative process is prevented by the mechanical removal of the cartilage; for nearly half the articular surface of the joint no longer remains. Cæteris paribus, therefore the case recovers more rapidly.

Less constitutional irritation.—Sixthly. The constitutional irritation is very much lessened by the diminution of the suppurative and ulcerative process, and by the ease with which the parts are restored. In the cases which I have had an opportunity of seeing, there was not more irritative fever than in the mildest cases of compound fracture.

Bone shattered.—Seventhly. It has been found that in cases in which the extremities of the bones forming the joint have been broken into small pieces, and in which these have been removed by the finger, the patient has suffered less, and has more quickly recovered, than when the bone has been returned whole.

No case of death.—Eighthly. I have known no case of death when the extremities of the bones have been sawn off, although I shall have occasion to mention some in which the cases terminated fatally when this was not done.

Objections; limb shorter.—The objections which may be made to this mode of treatment, are, that the limb becomes somewhat shorter by the removal of the cartilaginous extremity of the bone; but this I do not think an objection of any considerable weight, if the danger of the case be, as I believe, lessened by it; for the diminished length, which is very slight, is easily supplied by a shoe made a little thicker than usual.

Anchylosis.—The other objection is, that the joint becomes necessarily anchylosed. I doubt very much the reality of this objection, as in two instances I have seen the motion of the part remain; but even when the joint becomes anchylosed, a consequence to which it is liable in either mode of treatment, the motion of the tarsal bones becomes so much increased as to compensate for that of the ankle, the patient walks with much less halting than would be anticipated, and has a very useful limb.

Each mode useful.—My intention, however, is not to advocate either mode of treatment to the exclusion of the other, but to state the reasons which may be justly assigned for the occasional adoption of either. It is only by a comparison of the different results of varied practice that a safe conclusion can be drawn; and from what I have had an

opportunity of observing in my own practice, and of learning from that of my friends, I feel disposed to recommend to those whose minds are not settled upon the subject, not hastily to determine against either treatment in the different cases of this injury, as from each mode, under varied circumstances, a strong and useful limb has been saved without any additional risk to the life of the patient.

Cases in which the one or the other should be employed.—If the dislocation can be easily reduced without sawing off the end of the bone; if the bone be not so obliquely broken, but remain firmly placed upon the astralagus when reduced; if the end of the bone be not shattered, for then the small loose pieces of bone should be removed, and the surface of the bone be smoothed by the saw; if the patient be not excessively irritable, so as to occasion the muscles to be thrown into violent spasmodic actions in the attempt at reduction, which leads to subsequent displacement when the limb has been reduced; the bones should be at once returned into their places, and the parts should be united by the adhesive inflammation; but rather than amputate the limb, if the above circumstances were pesent, I should certainly saw off the ends of the bones."

Although in the majority of cases the limb may be saved, yet occasionally amputation will be necessary. With the following abstract of the circumstances under which it will be required, we will close this article.

1. *The advanced age of the patient.*

2. *A very extensive lacerated wound.*

3. *A difficulty in reducing the bones* has been considered a reason for amputation; but as this difficulty may always be obviated by sawing off the extremity of the bone, it should never be considered as a sufficient excuse for destroying the limb.

4. *A comminated fracture of the bones.*

"*Bones shattered.*—If the lower extremity of the tibia be broken into small pieces, the loose portions of bone ought to be removed, and the end of the tibia to be smoothed by a saw; but if, in addition to this comminution, the lower extremity of the tibia be obliquely broken, and a large loose portion of bone be felt with the fingers, then it will be proper to amputate: also, if the astralagus be broken, the portions of this bone should be removed, otherwise they will separate by ulceration, or occasion considerable local irritation."

5. *The dislocation of the tibia at the outer ankle.*

"The dislocation of the tibia at the outer ankle, produces much more

injury and danger than that at the inner, and amputation will be more frequently required for it, because both the bones and soft parts suffer more than in the dislocation inwards."

6. *It sometimes happens that when the bone is replaced it will not remain in its situation, and all the symptoms of the injury become renewed.*—This circumstance happens when the tibia, in the dislocation outwards, is obliquely fractured, and as only a small portion of the articulating extremity remains on the dislocated extremity of the tibia, it will not rest on the tibia when it is reduced.

7. *The division of a large blood-vessel* might, with an extensive wound of the integuments, lead to a necessity for amputation. Sir Astley thinks, however, that on account of the free anastomes of the arteries about the ankle joint, there will not be a necessity for amputating, unless the divison of the blood-vessel be accompanied with other untoward symptoms.

8. *Mortification of the foot.—Excessive contusion.—Extensive suppuration.*

9. *Exfoliations of bone*, which from being locked in the surrounding portions of bone, are incapable of being separated, and thus keep a continued state of irritation.

"My friend, Mr. Hamminck, had the kindness to send me a specimen of this kind, which he was obliged to amputate. The loose portion of the bone was seated between the lower extremity of the tibia and fibula, and reached to the ankle-joint; both the bones had been broken and had become reunited, and the uniting medium had inclosed and incarcerated the dead portion of bone. It is probable, from the appearance of the parts, that this portion of bone never would have been able to escape from the place in which it was locked."

10. *Excessive deformity of the foot.*

11. *Tetanus.*—Sir Astley disapproves of the practice of operating for the purpose of relieving the disease, the operation having appeared to precipitate a fatal issue. The practice of amputating upon the appearance of this disease was introduced by Baron Larrey with very high expectations, but the experience of other surgeons has not confirmed his sanguine anticipations.

12. *Corpulent persons*, unless they are in the habit of taking

active exercise, suffer more from injuries than others, and therefore are frequently compelled to submit to amputation, on account of injuries which would otherwise be attended with little difficulty.

We regret that we are here under the necessity of suspending our analysis of this valuable work. We do this the more willingly, however, because no abstract of the individual opinions of the author can supply the benefit which the student of surgery will derive from the recorded cases, illustrating every variety of accident, which could with propriety be introduced into a work of this kind. In addition to this, there is appended to the work, a valuable set of plates, which very much enhances its value.

In this country, where every physician is compelled to unite in his own person all the various departments of the profession, this volume should form a part of every medical library. Cases of surgery form a very important point of each individual's practice, and upon the dexterity and success with which he attends to them, will depend much of his reputation. It has been satirically said of our profession, that the grave conceals the errors of the physician; not so of the surgeon, whose patients frequently remain palpable monuments of his ignorance or carelessness. F.

ART. VI.—*Elements of Chemical Philosophy, on the Basis of Reid, comprising the Rudiments of that Science, and the requisite Illustrations, with Plates and Diagrams.* By THOMAS D. MITCHELL, M. D. Professor of Chemistry and Pharmacy, in the Medical College of Ohio; President of the Ohio Medical Lyceum; Honorary member of the Philadelphia Medical and Columbian Chemical Societies, &c. Corey & Fairbank.

The present volume, almost the first systematic work connected with the profession of Medicine or its associate sciences,

which has been published in the west, and emanating as it does from the Medical College of Ohio, seems to demand from the Journal, an extended notice. The liberal endowment which the Medical College has received and continues to receive from the State, demands from the Professors who occupy the exalted honor of a seat in that institution, a corresponding exertion to build up a domestic literature, and inspire a generous emulation in the young physicians of this country to observe, think, and write for themselves, and thus save their country from the degradation of depending upon other countries for the elements of their education. As an indication of a disposition to meet the just expectations of a State which has so liberally patronized them, as an earnest of greater and more elaborate efforts, we have no doubt the present volume will be scanned with an indulgent eye, and will receive a patronage fully in proportion to its merits.

It was our intention to have presented to our readers an elaborate review of the present volume, but having been disappointed in receiving assistance from a quarter in which we were led confidently to believe we should have received it, we are reduced to the necessity of giving it such a common place review as will afford to the public a general idea of its character, without entering into the scientific details which the occasion demands.

General plan of the work. The author flatters himself, that he has availed himself of a great improvement upon the general plan of arrangement pursued in chemical works, by adopting that of Dr. Reid, of Edinburgh. At the same time he has supplied some deficiencies in the work of Reid by "borrowing freely from the *course de chimie* of Languier." The advantages of this arrangement are, that commencing with the simple substances, he proceeds to the compound in such succession, as that the history of each is given with all the combinations which it forms, as far as practicable, without at any time anticipating the history of bodies whose properties have not been detailed.

The first chapter, after some general remarks and definitions, is devoted to the consideration of *Attraction, the Laws of Combi-*

nation, &c. Chapter II. is devoted to Light and Caloric; of the other imponderable agents, he dispenses with magnetism as altogether foreign to his work, and assigns to electricity and galvanism a separate chapter at the close of the work, as remarkable for its brevity as the space allotted to them in the lectures of his predecessor was for its diffuseness. An arrangement, we think, that by no means comports with their importance as chemical agents.

On the subject of light his ideas are not very accurate nor very perspicuously expressed. For instance, the author says, "the indispensable necessity of light to *perfect* vision is well understood;" we believe we may add, also, the indispensable necessity of light to *imperfect* vision is equally well understood.

Again, he says, "Light cannot be converted into a perceptible mass by any force that we can employ. Its levity is equal to its rapidity, and the one is probably the consequence of the other. Now, how levity can be the consequence of rapidity, or rapidity the consequence of levity, we cannot conceive, having always understood that the *vis inertiæ* of matter induced it to move with a velocity proportionate to the impulse by which it is set in motion, without any regard to its weight.

He appears to favor the opinion, that between light and caloric there is an identity of nature and action, and after detailing a number of instances in which similar results are produced by their agency, he adds, "Here it would seem that caloric and light act precisely alike, and thus far they are identical." It certainly is a very loose mode of reasoning which would infer that all substances which have a tendency to produce similar results must be identical, especially, when the whole amount of the agency appears to be, as it is in the present instance, the removal of an obstacle in the way of chemical action. In the same way might be proved not only the identity of caloric and light, but of caloric and electricity, and of a thousand other chemical agents bearing still less resemblance.

The properties and effects of caloric are illustrated in a very familiar and perspicuous manner. Its radiation and reflection are exemplified by the familiar experiment of two opposite and

parallel mirrors. A heated ball being placed in the focus of one, and a thermometer in the focus of the other, the mercury will immediately rise, although the ball by itself would produce no sensible impression even when placed much nearer the thermometer than in the experiment.

"The focal ball does, unquestionably, radiate caloric; for as it is a dull, unpolished body, it cannot reflect. The best reflection viz. polished metals, are the worst radiators; and the best radiators, as all dull, tarnished bodies, are the worst reflectors, or rather, they do not reflect at all. But what becomes of the caloric radiated or sent out, from the focal ball? We answer, it passes or diverges to the circumference of the corresponding mirror, from which it flies off in straight and parallel lines to the circumference of the opposite mirror, from which, by a natural tendency, it converges to the central or focal point, and there falls on the thermometer, ether glass, or candle, producing the effects previously stated.

The experiment with the concave mirrors, may be further varied, to illustrate the reflection of heat. Thus substitute a lump of ice, for the heated iron ball, and very soon, the thermometer in the focus of the other mirror will be affected, and its fluid will fall. Now, say some, this is proof, that cold is a positive agent, and not the mere abstraction of heat. They contend, that the frigorific particles pass from the ice to the thermometer, and act on it, by a positive power. This, however, is a mistake. Remove the ice from the focal point to a place midway between the mirrors, and the thermometer will not be affected; whereas, on the supposition of a positive frigorific agency, the reverse should occur. The true state of the case is this. The ice, being in its proper focus, receives caloric from the thermometer, which is comparatively, the hotter body. The rays, passing from the thermometer to the circumference of the mirror, then go in straight parallel lines, to the circumference of the opposite mirror, and thence converge, to meet in the ice, which occupies the focal point. The fluid of the thermometer sinks, therefore, because it parts with its caloric, to give it to the colder body."

If these experiments prove that caloric exerts a positive influence, the proof is equally decided in favor of the positive agency of cold. In the professor's argument respecting the influence of cold, there is a perfect misrepresentation of the whole question. Those who say that "cold is a positive agent and not the mere abstraction of heat," do not necessarily contend that the frigorific particles pass from the ice to the thermometer, and act upon it by a positive power. On the contrary, they contend

for the privilege of supposing, as the professor does in relation to caloric, that it passes to the nearest reflector, and being reflected from it to the other, is concentrated in the focus of the last reflector. The experiment, if true, cannot by any explanation be made to prove any thing but the radiation of cold, and if we admit this property in cold, we cannot deny it a positive agency.

The manner in which this proof positive is explained away, has always appeared to us destitute of every kind of analogical support. What influence can arise from the fact of "the ice being in its proper focus" to make the rays pass from the thermometer to the circumference of the mirror, then go in parallel lines to the circumference of the opposite mirror, and thence converge to meet in the ice which occupies the focal point. We cannot see why the caloric should choose to travel by a circuitous route forty feet instead of travelling to its object through one-fourth of the distance. We are the more disposed to notice the imperfection of this explanation, because it has servilely passed from one copyist to another, without examination, until it has become as generally received as if it were established upon the solid basis of experiment or analogical reasoning.

In speaking of the capacity of bodies for caloric, the author remarks: "two portions of the same body, in the same condition, have precisely the same capacity for caloric, as may be readily shown by mixing a pound of water at 50 deg. with another at 100. The temperature of the mixture will be exactly 75, or the mean heat of the two pounds." Is this true as a general principle?

Professor M. has the following remarks upon the modus operandi of caloric and cold, as medical agents.

"The medical uses of caloric, and also of cold, or the abstraction of heat, claim a passing note; and the main reason for the remarks to be presented on this subject, is, to correct an error in regard to the modus operandi of *cold*. All agree that heat, whether internally or externally applied, in form of vapor, or water, or in any other way, stimulates the system, and increases the action of the heart and arte-

ries. On the simple principle of its repulsive power, its tendency to expand bodies subjected to its influence, one could hardly anticipate any other result from its application to the human body, than that which is constantly witnessed. These things being so, what must, on common sense principles, be the result of an inevitable abstraction of such an agent? Every one who is prepared to look at things just as they are, rather than to examine them through the spectacles of mysticism, will perceive, at once, that the abstraction of heat must give rise to effects of an opposite character to those which follow its direct application. It results, therefore, as a matter of necessity, that *cold* is a sedative; that is, an agent, (if that term be allowed to a mere negative,) which lessens the vital energies, and would ultimately destroy the principle of life, if not properly counteracted.

All admit that alcohol is a stimulus, because it is impossible to resist the daily evidence of our senses on this subject. An individual will keep his system up to the point of full toned excitement, by pursuing a regular course in the use of this poison. But suppose that some one who has power to restrain this lover of the unnatural stimulus, exerts his influence, so as to stop, instantly, the wonted allowance, and to substitute cold water in its place. Here is a case of abstraction of a powerful stimulus, and look at the result. The man's whole frame indicates that a storm is gathering. His energies flag, and he is completely unnerved. Look at the drunkard, who has delayed, for an hour or two, his morning dram, and see if his system cannot furnish evidence, that the want of the accustomed stimulus operates as a sedative. Why, the unhappy creature has about him a temporary palsy; his hand shakes, his tongue falters, and he grasps the glass, as a drowning man would seize a straw. Look at him after he has swallowed the dose, and, in a few minutes, you discover, that the stimulus has had its accustomed effects; and the conviction is irresistible, that while alcohol is an unnatural stimulus to the drunkard, the abstraction is a tremendous sedative. It is precisely so with heat; its action is always to produce positive effects, while cold, operating in its negative character, always produces corresponding results. It is therefore a palpable contradiction, to say that *cold* is a ***stimulus***."

Gentlemen are as liable to err when they look at facts through the spectacles of hypothesis or false analogies, as when they examine them through the spectacles of mysticism. The Doctor asserts that heat acts as a stimulant; first, upon universal consent; secondly, because it must be so on the "simple principle of its repulsive power, its tendency to expand bodies subjected to its influence;" the inevitable inference therefore is, that cold—"the simple abstraction of such an agent" "must be sedative." Last of all, to complete the argument, he brings in the analogy of the influence of ardent spirits upon the animal economy.

Let us now divest this argument of the aid it derives from hypothesis and false analogy, and what is the true state of the question? The animal economy is so constituted, that a certain temperature is essential to vitality—not as a stimulus, but as requisite to the healthful condition of the organs of animal life. Apply cold or heat, and a sensation of pain is produced, and as a consequence of the impression upon the nervous system, an increased action of the powers of animal life takes place. If the appellation of stimulant can be applied to either of these agents, it is certainly more appropriate to the former than the latter. A temperature above the ordinary standard is always debilitating to the general system, and is directly and immediately so. It never increases the strength as alcohol does. A diminished temperature, provided it be within a certain limit, is always conducive to the strength and vigor of a constitution that is unimpaired by disease. The increase of the capillary action, indicated by a glow of heat, is as instantaneous as the sensation of cold. A determination to the surface takes place, animal heat is more rapidly developed, the action of the heart is more vigorous, digestion, absorption, and secretion go on more rapidly. The muscular strength and the power to endure fatigue is greatly increased. Now, in all this, there is no "mysticism." It is the universal language of common sense, founded upon the experience of all mankind.

It is true, that upon a subject of this kind, where the practice is so well settled as it is in relation to the remedial effects of cold, hypothesis is of little consequence. So much dissention prevails in the republic of literature, that speculations, little important in themselves, sometimes become serious affairs on account of the language in which they are couched.

Chapter III. contains a brief and perspicuous account of the principles upon which the nomenclature of Lavoirsier is founded, with the alterations which subsequent discoveries have rendered necessary.

Professor Mitchell was fortunate enough to advance an opinion twenty years ago, which the progress of chemical sci-

ence has since amply confirmed, viz. that there is nothing in nature corresponding to Lavoisier's "Acidifying principle."

"Formerly it was supposed, that all acids contained oxygen, as an *acidifying principle;* but as the union of chlorine, iodine, &c. with hydrogen, gives rise to acids, we now distinguish between *oxacids* and *hydracids.* Thus, sulphur, chlorine, iodine, bromine, &c., in union with oxygen, form sulphuric, chloric, iodic, and entirely apart from the influence of oxygen, form hydrosulphuric, hydrochloric, hydriodic, and hydrobromic acids. Whenever the term *hydro* is prefixed to an acid, we are to regard it as an abreviation of hydrogen, which substance is a constituent part of the acid.

On the subject of an acidifying principle, I have given my views at length some years ago. It may not be amiss, however, to state, in this place, that the advances which chemical science is constantly making, have confirmed my early opinions on this point. I repeat, that the term acidifying principle is utterly unphilosophical, not only as applied to oxygen, but to hydrogen, and to every agent which may be supposed to exert an influence in developing acid properties. Every result in nature or produced by art, is a relative effect, and every item concerned, remotely or directly, in the accomplishment of the end, is essential to that end. Hence, I insist, that if an acid be discovered, which shall compose fifty component parts, all of which are requisite in the formation of the compound, the only characteristic of which is acidity, I may affirm with equal propriety of any one, as of any other, of its constituents, that this or that is the acidifying principle. Abstract from the compound either of its parts, and you destroy the peculiar, distinctive character of the acid."

Upon the same ground he rejects the opinion of a principle of alkalinity and of inflammability. It is, indeed, very true, if the opinion of modern chemists is correct, that oxygen is not essential to acidification; and yet the course of reasoning upon which this advance beyond the opinions of the age was predicated, does not appear to have resulted from a very perfect understanding of the use of the term "*principle.*" It never, we presume, entered into the head of Lavoisier to convey the idea that the acids could be formed by oxygen alone; on the contrary, the specific name carbonic, sulphuric, &c. &c. indicates very clearly that Lavoisier meant no more than to point out oxygen as necessarily present in the formation of an acid. And the very slight alterations which are necessary to adapt his nomenclature to the present improved condition of Chemistry,

serve to confirm the correctness of the principle upon which that nomenclature was established. Oxygen is indispensably necessary to the formation of almost all acids, and upon this fact was founded Lavoisier's nomenclature. A very few simple substances have since been discovered, which, by an union with hydrogen, form compounds, presenting the characters of acids in a greater or less degree; and these form exceptions to his theory, which still, however, is perfectly adapted to the explanation of almost all the phenomena which the science of Chemistry took cognizance of in his day. The discoveries which have been made since his time consist rather in the collection of a great number of isolated facts, than in the arrrangement of them under any general system of classification. Perhaps we may say of Chemistry, that, as a science, it is confined in its application to the simplest combinations of unorganic matter; and that in proceeding to apply its principles to the complicated combinations of the vegetable and animal kingdom, we find ourselves at every step surrounded by anomalies which we are unable to explain. The following remarks upon the theory of combustion, in a subsequent part of the volume, place the Professor's views in a more favourable aspect.

"Lavoisier probably erred, in accounting for the heat and light evolved in combustion, by reason of the limited view he took of the subject. It would require an infinite number of experiments, to determine with precision the source of light and heat in all cases of combustion, and the precise quantity of these evolved, in each instance, from each body submitted to the process. We say, by way of general remark, that light and heat are properties of all sorts of matter, and that when these are evolved during combustion, it does not arise from any new creation, but from their simple disengagement from the burning bodies, in which they exist by nature, as inherent attributes.

If discovery, in regard to supporters of combustion, had ceased with the production of oxygen, the Lavoisierian system had retained its popularity to the present hour. But the inquiring curiosity of the chemist was not satisfied with present attainments, and his diligent researches soon brought to light, chlorine, iodine, and bromine. In the honor of these discoveries Sir Humphrey Davy had the largest share, and the world is deeply indebted to him for the fruits of his untiring zeal.

The announcement of chlorine and its striking peculiarities, constituted the reasons for what has been designated, *the chloridic theory.*

As *oxymuriatic acid*, this substance had been familiar, as a supporter of combustion; but its powers in that character were ascribed to the presence of oxygen, its compound nature being then universally acknowledged. And such was the tenacity with which long-cherished opinions were held, that the compound quality of oxymuriatic acid was contended for, long after the publication of experiments proving the elementary nature of that body. The most able opponent of the simple character of oxymuriatic acid, was Murray, and for a while he enlisted many on his side of the question. My own inaugural dissertation was, in part, an attempt to disprove the simple character of chlorine, but I am happy to acknowledge, that so far as experiments appear to go, we are bound to regard chlorine as an element.

In this state of things, it ceased to be true, that oxygen was the only simple substance possessing the attribute of supporting combustion. But chlorine did not long stand alone, but was followed by iodine, bromine, sulphuretted hydrogen, and others, which, under given circumstances, evidently maintain the character of supporters of combustion.

These apparent exceptions to the spirit of the Lavoisierian system, seem rather to accord with it, or to be extensions of it. All of them are at war with the notion of the phlogistic system, that combustibles, in burning, become lighter. And even in their bearings on the doctrine of acidification, they present analogies, rather than contrarieties, to the anti-phlogistic system.

In conclusion, we regard combustion as the result of the action of material particles upon each other, as influenced by strong chemical attractions, or opposite electrical conditions, and that it is a necessary consequence of an intense and violent motion botween the molecules of matter, whatever be the exciting cause. As light and heat are inherent properties of all matter, we hold, that the evolution of these is not a new product, growing out of the act of combustion, but a mere disengagement or disturbance of these essential constituents of material particles.

In proceeding to the descriptive part of the work, we have few remarks to make. The author's descriptions are generally very perspicuous, his experiments appropriate, and his illustrations peculiarly happy. His method of exemplifying the doctrine of definite proportions, and applying its principles to the analysis and composition of the objects of chemical investigation are very striking, and cannot fail to impress the subject indelibly upon the mind of every attentive reader.

In conformity with the author's general plan of arrangement, the vegetable acids and alkalies occupy a conspicuous situation in the body of the work, following immediately the history of the gases of which they are composed. In conformity with this

principle of arrangement ammonia should, perhaps, have occupied the same position. The resemblance, however, of this latter substance to the fixed alkalies, determined the author to place it in connexion with them; an arrangement which derives still further countenance from the experiment of Berzelius, which seems to prove that it, like the other alkalies, has a metallic base.

The account of the vegetable alkalies is very full and complete, but as this subject has been repeatedly referred to in this Journal, we shall not at present allude to it.

Professor M. thinks that injustice has been done to Lavoisier and other Chemists, by ascribing the honor of discovering the metallic base of the alkalies exclusively to Sir Humphrey Davy. Lavoisier suspected it, and Professor Woodhouse, of the University of Pennsylvania, seems to have reduced potash from its oxyde.

"There can scarcely be a doubt, that Professor Woodhouse (formerly of the University of Pennsylvania) was the first person who actually reduced potash to the metallic state. He was operating with pearlash and soot, exposed to a very high degree of heat in a covered crucible, and perceived, that water thrown on the mixture, when quite cold caused it to take fire. He repeated the experiment with charcoal, and the same result followed. He had never seen potassium, nor heard of it; but who will now entertain a doubt, that he actually decomposed potash in the experiment which seemed to him quite unintelligible, and that the combustion which occurred under his notice, was the effect, so often seen in latter times, of the contact of potassium with water."

Honor to whom honor is due. Sir H. Davy certainly has a sufficient basis for his fame, without detracting from the merits of his distinguished predecessors.

As the change in the nomenclature, which has resulted from the discovery of the simple character of chlorine, has produced some confusion in the use of medical terms, we subjoin the following account of Chloride of Sodium, for the purpose of enabling those who are familiar only with the ancient nomenclature, to accommodate themselves to the change of language which the extension of the science has introduced.

"*Chloride of Sodium.*—This is composed of one equivalent of chlorine, 36, and one of sodium, 24. It may be made by burning sodium

in chlorine, or by heating it in muriatic acid gas. In the latter case, it effects a decomposition, taking chlorine from the muriatic acid and setting its hydrogen at liberty. If a solution of common salt (muriate of soda) be evaporated, crystals of the chloride are deposited; for this salt, like the muriate of potash, can exist, as such, only in solution, and is converted into a chloride by expelling the water, so as to reduce the whole to crystals. We are, therefore, to regard the solution of common salt as a true muriate of soda, and the same solution reduced by evaporation to the crystallised state, as a chloride of sodium. When water is added to the chloride, that liquid is decomposed; its oxygen joins the sodium to form the protoxyde of soda, while its hydrogen unites to the chlorine to form muriatic acid, and the muriatic acid combines with the protoxyde of soda, to make the muriate of soda. Sodium has a much stronger attraction for chlorine than for oxygen, and hence, soda or its hydrate is decomposed by chlorine, and a chloride of sodium is formed.

The following account of an article, at present much in use as a disinfecting agent, will be acceptable to many of our readers.

"Chloride of sodium is sometimes confounded with *chloride of soda*, but they are different articles. The latter seems to offer a departure from the analogy, generally observed, between the compounds of oxygen, and those of chlorine, iodine, &c. The chloride of soda is, evidently, a chloride of an oxyde. and it is certain, we have no instance of an oxyde of a chloride. For this reason, it was at first doubted, that chlorine could combine, chemically, with either lime or soda, and I do not believe that a true chemical union exists. It is most likely, that the lime and soda retain the chlorine, pretty much as charcoal retains large bulks of various gases, or as water holds in solution ammoniacal gas. Dr. Ure speaks of the *absorption* of chlorine by the hydrate of lime, and it certainly remains to be shown, that any other state of union exists in these chlorides, than that of simple mixture. The evidence in favour of the chemical composition of atmospheric air is, in my view, far stronger than any that has yet been adduced, to prove chloride of soda is a true chemical compound.

Pure chloride of soda is prepared, by passing a current of chlorine gas into a cold and dilute solution of caustic soda, until no more gas can be taken up. Common carbonate of soda may be used in place of the pure alkali; but considerable excess of chlorine must be employed, in order to displace the whole of the carbonic acid."

The author's account of the *Mineral and Vegetable Poisons*—of their tests, antidotes, &c. is very satisfactory. We subjoin the following mode of procuring a solution of arsenic in cases of supposed poisoning, free from admixture with animal and vegetable matter.

"Though considerable information may be obtained, by applying the tests we have described to mixed solutions, suspected to contain the poison, and when they all concur, in the indications which they give of arsenious acid, little doubt can be entertained of its presence; still, in order to avoid every source of fallacy, it will be necessary to continue our investigation still further, separating the matter that appears to have produced the characteristic precipitate with the arsenious acid, and extracting the metal itself, if any arsenious acid shall have been present.

For this purpose, Dr. Christison recommends sulphuretted hydrogen to be employed, dispensing with the other tests; the liquid should be boiled and filtered in the first place, and then acidulated with muriatic or acetic acid, to prevent any alkaline matter, that may be present, from interfering with the precipitation; after which, a stream of sulphuretted hydrogen should be passed through the liquid, and continued, at least, for half an hour; it is then to be boiled, for a few minutes, to expel any excess of sulphuretted hydrogen, and the precipitate collected on a filter, washing it repeatedly with water, and drying it afterwards, by heating it at a temperature of 212 deg. On mixing it intimately with about twice its weight of black flux, and exposing it to heat in a glass tube, over a spirit lamp, the potassium in the black flux combines with the sulphur, and the metallic arsenic is sublimed in the same manner, as in the reduction of arsenious acid, by the same substance. The size of the tube must be adapted to the quantity of the precipitate which has been procured; the most convenient size is about three or four inches long, and about a quarter or a half inch in diameter; the mixture should not fill more than half an inch of the lower part of the tube, and smaller tubes should be used, when only a very minute quantity of matter has been precipitated.

If a crust of metallic arsenic should be obtained, its steel-gray lustre, its brittleness, the facility with which it is volatilised, and the garlic odor that is, at the same time, produced, will be sufficient to distinguish it from any other substance; if, however, there are only very indistinct appearances of the metallic arsenic, the following is the method that I have found most satisfactory, for ascertaining if arsenic be really present. The tube is to be exposed again to heat, over the spirit lamp, till the matter that has been sublimed, is carried a little farther up the tube and completely separated from the black matter that remains at the bottom; the lower part of the tube must then be broken off, drawing a file across it, previously, that it may be easily removed, and the upper part put into another glass tube and boiled, for five or ten minutes, with a little water, to which a few drops of nitric acid have been added. If the tube be coated with any arsenious acid, it will be immediately dissolved, and if any metallic arsenic should be present, it also will be converted into arsenious acid, attracting oxygen from the nitric acid, and being dissolved at the same time, so that the liquid may now be considered as a solution of arsenious acid in water, with a small quantity of nitric acid; and accordingly, on neutralising the excess of acid, by dropping ammonia into it, through a test-tube

drawn out at the extremity over a spirit lamp, so as to represent a small funnel terminating in a capillary tube, the ammoniaco-nitrates of copper and silver will produce the characteristic green and yellow precipitates. If they should give no precipitates, then we may conclude, that the mixture which we have examined, contains no arsenic.

Digest a quarter of a grain of metallic arsenic in a test-tube, with a drachm of water and two or three drops of nitric acid, and neutralise the solution with ammonia, in the manner described in the preceding paragraph. Put a number of drops of the solution, on different parts of a sheet of white paper, and touch them with glass rods, dipped in the different solutions used for the detection of arsenious acid, and the characteristic color will appear in each. We must be careful not to dip the same glass rods into different solutions, without previously removing any liquid that may be still adhering to them.

The indications, given by the different tests, are free from every source of fallacy, when they are added to solutions prepared in this manner; as the arsenious acid is thus removed from all the animal and vegetable matter, that might have interfered with their action in the mixed liquid. Infusions of astringent matter and some other vegetable and animal substances, which are frequently met with in the liquid contents of the stomach, have been shown, by Dr. Christison, to be capable of retaining, in solution, the precipitates that arsenious acid gives with the ammoniaco-nitrates of copper and silver. Tartaric and acetic acids appear to be solvents, in some cases, arsenite of silver being soluble in both.

Orfila has proposed to use chlorine, and Mr. Phillips animal charcoal, to decolorise mixed fluids, suspected to contain arsenious acid, and allow the usual tests to be applied in the liquid way, without previously removing the arsenious acid and subjecting it to some process of reduction; but though both may occasionally be used with advantage, it will be better to adopt the method we have already mentioned. It appears, also, from the experiments of Drs. Christison and Paris, that charcoal is capable of precipitating arsenious acid from its solution in water."

We consider it rather a defect in a work designed expressly for medical students, that the chapter devoted to *Animal Chemistry* and the *analysis of Mineral Waters* should be so brief. The same remark may be applied to the section upon Electricity and Galvanism—the whole of which is comprised in the space of four pages—a notice altogether too limited, when we reflect upon their importance as chemical agents.

The present volume we consider to be, in many respects, a very valuable one. The professions of the author are very moderate. His object is simply to prepare for his class and his

general readers, a summary of the science, arranged upon a principle, offering, as he conceives, many advantages above the plan generally adopted. It is designed simply as an elementary treatise, and for this purpose we think it has many merits. The style of description and illustration is very good, and as a treatise on chemistry is principally made up of description and illustration, a merit of this kind is the highest recommendation it could possess. In his attempts at reasoning, the author is not always equally happy—his ratiocination being often loose, declamatory, and desultory, and his deductions far-fetched and illogical.

There is another defect in the work, which, although many, and perhaps the most of mankind may think little of it, is a matter of serious consequence. We allude to an occasional habit of speaking in a style of arrogant denunciation towards those who are so unfortunate as to incur the displeasure of the author. The quarrels of authors form no small part of the evils which disturb the peace and harmony of society, and we see no reason therefore, why their conduct towards each other should not be directed by the same rules which regulate the intercourse of men in the ordinary walks of social life.

It would be injustice to the enterprising publishers of this volume, not to notice the neat and beautiful style of execution in which they have presented it to the public. We hope the friends of the American System will liberally patronize this production, so creditable to the Domestic Industry of the West.

ART. VI.—*On Baths and Mineral Waters.* In two parts. Part I. A full account of the hygienic and curative powers of *cold*, *tepid*, *warm*, *hot*, and *vapor* baths, and of *sea* bathing. Part II. A history of the chemical composition, and medicinal properties of the chief Mineral Springs of the United States and of Europe. By JOHN BELL, M. D., Lecturer on the Institutes of Medicine and Medical Jurisprudence, &c. &c. Philadelphia, Carey & Lea.

The subject of the present volume, although one of great importance to the physician, and one upon which his advice is frequently asked, is scarcely thought of as a necessary or important part of his education. Believing the treatise of Dr. Bell to be well calculated to draw the attention of physicians to this neglected department of their profession, we shall notice a few of the most important of the topics upon which he treats, for the purpose rather of exciting than of allaying the curiosity of our readers.

Chapter I. is devoted to the history of Bathing, among different nations and in different ages of the world. Every person is familiar with the estimation in which Bathing was held among the ancient Greeks and Romans, and with the eagerness with which it is resorted to by the Eastern and Northern nations of the present day. This attachment has laid the foundation for a species of luxury, in which the utmost extravagance is manifested; of this the author has collected many curious instances in the present volume.

Chapter II. is devoted to the skin, its anatomical and physiological properties, its sympathies, &c. The following is a summary of the principles he advances:

"1. The skin, with a superficies in an adult of about fifteen square feet, consists of three laminæ, the outer one hard, and in a measure horny; the second and middle soft and pulpy; the third and inner firm and resisting, with a great many fine vessels and nerves spread over it after having penetrated it from the fatty and cellular tissue beneath.

2. From the cutaneous surface is secreted and exhaled different gasses, the chief of which is carbonic acid gas or fixed air, a watery

vapor or insensible perspiration, and at times an aqueous fluid, holding salts in solution, and constituting what is called sweat: from small bodies or glands there is also discharged on particular regions of the skin, an oleaginous fluid. The skin absorbs or allows to pass through its pores various gasses, the chief of which is oxygen gas, and also watery vapor.

3. In addition to its other offices of supply and discharge, the skin is also the seat of the sense of touch, and as such is connected with the brain, and other senses, by a variety of relations.

4. Acting by a well established law in physics, the skin is a surface for evaporation and consequent cooling.

5. This tissue is continuous in the various openings at the eyes, nostrils, lips, &c. with the membranes lining the eye-lids, and those on which take place the senses of smell and taste; also with those continued from these parts down into the lungs in one direction, and stomach and intestines in another, and on which take place the chief phenomena of respiration, and of the different stages of digestion. In another direction, the skin is continuous with the mucous membranes lining the organs peculiar to each sex.

6. The sympathies of the cutaneous tissue with these internal membranes, must, *a priori*, seem evident, as well from the general sameness of structure as from community of office—the skin exhaling and absorbing vapors and gasses like the lungs, and fluids like the digestive canal. But not only does it sympathise with these, but with other membranes of the serous class, such as that investing the lungs, and the one covering the abdominal viscera; also, that variety lining the joints, &c.

7. The influence of the skin over the animal economy must be manifestly great, and of course the operation of the agents, by which it is impressed, ought to be familiar to us. These act in two ways. 1. By exciting or diminishing its nutritive functions of absorption, and secretion and excretion; and, 2. By increasing or diminishing its sensibility and sensations.

Bathing affects it in all these ways: by softening the cuticle or outer hard lamina of the skin, a more ready entrance is afforded to water and other fluids, and by subsequent friction, this part more readily peels off, so as to leave the skin more delicate for the discharge of its various functions: in addition to this, baths, by their temperature acting on their sentient extremities of the nerves, and the minute blood-vessels blended with them, will either accelerate or retard the functions, according as the medium in which the body is immersed be hot or cold.

8. Simultaneously with these changes in the functions of the skin, or immediately consequent upon them, will be changes in the nervous system in general, and in the circulation, respiration, digestion, and various secretions, by the links and means already designated.

9. The effects of bathing are relative to the temperature of the fluid and that of the living body to which it is applied.

10. The medium temperature of the human body is from 96 to 98 deg. Fahrenheit. The warmth is less at the extremities than in the

central parts of the body, so that in this respect there is often a difference of 6 or 8 deg. between the hands and the arm pit, even when the former do not feel at all cold to their possessor.

11. Although our bodies are, in degree, obedient to the laws which govern the transmission of caloric in the material world generally, yet we have, obviously, independent sources of heat, and means for preserving an equilibrium of the animal temperature.

12. The air in which we live being almost all of a lower temperature than that of the body, there is a constant evolution, and discharge of caloric from the latter into the former. This loss would become excessive in low temperatures, but for the covering of the skin, which is a bad conductor, and the protection afforded by clothing of woollen, or furs, which are also imperfect conductors of heat.

13. In the winter season, and in cold climates, the digestion is more vigorous, respiration fuller and complete, and nutrition more active; there is, in fine, an activity of all the organs of internal life, by which caloric is secreted. The absence, in a great measure of sensible perspiration, or sweat, prevents the loss of heat by evaporation, and the skin from being such a good conductor as in the opposite state of things.

14. The excitement produced by living in air of an elevated temperature, is moderated by the increased cutaneous secretion, or sweat, and consequent evaporation.

15. Our sensations of heat will mainly depend on the proportion between the formation of caloric in the organs of the animal economy, and its expenditure by the surrounding air and inert substances with which we are in contact.

16. Habit reconciles us to a wide range of atmospherical temperature. Cold air, unless so extreme as to benumb the nervous expansions of the skin, and enfeeble the nervous energy and functions generally, and hot air, equal to, and sometimes exceeding the medium temperature of the body, unless perspiration be suppressed, are both well borne. In both the average heat of the body remains the same.

17. The exhausting effects of cold, always readily felt at the extremities of the body, must be obviated, by attention to all the means, already indicated, for giving energy to the system, or in other words, increasing the action of the minute vessels and nerves of the organs, by which caloric is evolved.

18. The more vigorous the circulation and nervous energy, the better can cold be borne. External heat, then, by exciting the functions, and contributing to the evolution of animal heat, enables us the better to resist cold. This must be understood of the equable operation of external heat, and its not being continued so long as to exhaust the minute vessels of the skin by copious perspiration, and of other parts by abundant discharges.

19. The medium temperature of the body is less in infancy and old age, and the ability to resist at these times the exhausting effects of cold is also less.

20. Inordinate heat of the body is felt when the cooling processes, by perspiration and evaporation, are checked. It then becomes necessary to moderate the excessive action of the organs of the body, from

all of which the caloric is evolved. This is best done by cold applied to the skin, or by means of cold drinks to the stomach, and cold injections into the intestinal canal.

21. Our sensations of heat and cold vary, according to the conducting power of the substances applied to our bodies, and the suddenness of the change in the temperature of the medium in which we are placed.

22. Unaccustomed as we are to immersion in a watery medium, added to its ready conducting power, prevents us from experiencing any very decided sensation of warmth in a bath of less temperature than that of the human body, or at least, of its extremities.

It is a fact familiar to every body, that long exposure to cold, even when not productive of injurious consequences, diminishes the power of forming caloric, or at least produces a sensibility to cold, that makes a reduction of temperature very uncomfortable. It is not, however, so generally known that exposure to a high temperature for a short time, fortifies the body against cold. The Russian goes from a bath of from 120 to 140 deg. of Fahrenheit to enjoy the luxury of rolling himself in the snow; and Acerbi states that Finnish peasants, after a vapour bath of 167 of Fahrenheit, will, for hours, expose themselves naked to an atmosphere 24 deg. below zero. It is to most persons a matter of surprise that they are able to bear these sudden extremes. It is the opinion of the author, that the body derives its power of resisting the influence of cold from the excitement produced by the increased temperature, and that it is only after the system begins to experience the indirect debility resulting from heat, that a sudden change of temperature produces injurious consequences. This opinion we have no doubt is correct, and is worth attending to; and hence it will follow, as an important practical maxim, that while the habitual use of the cold bath will fortify the constitution against cold, the use of the warm bath will best protect against occasional exposure.

Chapter III., on the *Division of Baths*. Individual peculiarities will lead them to ascribe the appellation of cold, tepid, warm or hot, to baths of very different temperatures. Dr. Bell states that a bath below 70 deg. will produce a continued sensation of cold upon all persons, and under all circumstances. A bath ranging between 74 and 82, will be cool, producing a momentary

shock, which will probably be followed by a sensation of warmth. We may take 95 deg. as the medium temperature of the warm bath, and by allowing 3 deg. above and below this we will have sufficient room for adaptation to every variety of individual peculiarity.

Vapor baths may be divided into the *moist* or *dry*, and into the *simple* and *medicated*.

Chapter IV. is appropriated to the *cold bath*. The cold bath, the author contends very strongly, is debilitating. He infers this from the symptoms which succeed its application; 1, the constriction and diminished circulation of the skin; 2, the effects upon the internal organs—the lungs, digestive organs, and the brain.

"First then, as to the manner in which the lungs are affected. A warm, and, still more, a hot vapor given out during respiration indicates an active, and in the latter case, highly excited state of the pulmonary circulation, and especially of the capillaries of the lining mucous membrane. Now, if a person, whose lungs are in this state of strong functional exercise, goes into a cold bath, we discover very speedily that the air which is expired is no longer hot or even near so warm as in common, nor so abundant in vapor. In other words, the air taken into the lungs is returned without undergoing changes to the same extent as before the cold immersion; and this is direct evidence of the diminished activity of the pulmonary circulation, and of the secreting function of the respiratory mucous surface, which latter is in fact similarly, though not to the same extent, affected as the skin. Secondly, as to what transpires in the digestive canal; the changes in it are tolerably well represented by the corresponding alterations of appearance in the tongue and lining membrane of the mouth and fauces. It is well known, that when the stomach is highly excited, irritated, or inflamed, the amount of blood circulating through, and contained in its vessels, is greater than before: there is a sensation of heat in the parts, and thirst; the mouth is dry and parched, and the tongue is in the same state, and, in general, preternaturally red. Let a person thus suffering, use the cold bath, and what results? The mouth loses much of its dryness, the tongue much of its redness, if it do not become actually pale, thirst is no longer felt and the sensation of inward heat complained of, as well in the stomach as in the chest, has disappeared. Surely these two series of phenomena in the pulmonary and digestive apparatus, for changes similar to those above described in the state of the stomach, take place also in the course of the intestinal canal, afford no evidence of an unusual determination of blood to the organs of which they consist. On the contrary, we have an intimate conviction, from the feelings and symptoms, that there is now

less blood, and a less active circulation, as well as diminished sensibility in these parts, such as we know there is in the skin. If, in the third place, we ask whether the paleness of the face, and the obviously diminished activity of the external vessels of the neck and head be replaced, in the cold bath, by an accumulation of blood in the brain, we cannot, on examination, but answer in the negative. The functions of the brain are vigorous in proportion to the amount of blood distributed to this organ; and it is only when the supply is excessive that the mental faculties, for a while preternaturally active, become perturbed and weakened, as in the state preceding delirium and apoplexy, and pending these maladies. But no symptoms analogous to these are discovered on immersion in the cold bath, and when the presumed determination of blood to the brain is supposed to exist. From the first application of the cold fluid, there follows impaired mental vivacity; the person feels dull, has his range of ideas limited, and perceptions blunted; he is torpid; but it is the torpor of gradually abated cerebral circulation, unaccompanied by those sensations of fulness, and singing in the ears, which would be caused by undue determination of blood to the part. Restoration of the accustomed activity of the faculties and senses generally, in the case of the cold bath, is performed by means the very opposite of those which we would have recourse to where undue determination of blood existed. External warmth, and a mild, stimulating drink, are sufficient to relieve the torpor from cold; they would aggravate the state of a brain, when undue determination of blood has been the cause."

Dr. Bell further supports his opinion 3. From the diminution of muscular power; and 4, the diminished secretion of animal heat. The glow of heat which healthy persons experience immediately after coming out of a cold bath, he asserts is "merely relative to the cold medium in which the body has been immersed a few minutes before," and is in conformity with a very general law of the animal economy, viz. that the abstraction of a stimulus renders the body more sensible to its influence when it is restored. There is, however, at this time, in reality, no increase of the animal heat, on the contrary, the thermometer indicates the temperature to be below the standard of health.

This opinion, he thinks, is still further strengthened by the success of its remedial application,—it being given with advantage in diseases of increased action, and contra-indicated when the powers of the constitution are impaired, and the heat of the body below the healthy standard.

In this mode of reasoning there certainly appears, to us, to be

great inaccuracy. It is very true that heat is so essential to the existence of animal life, that any considerable and permanent reduction of the temperature must be fatal. So long, however, as the body is not exposed to such a degree of cold as to carry off the animal heat more rapidly than it can be generated, the sensation of cold is undoubtedly a stimulant. If evidence of this is wanting, it is to be found in the increased capacity to sustain labor and fatigue, and in the florid complexion of those who are exposed to a degree of cold which the powers of the constitution, invigorated by exercise, are enabled to sustain. The body of a healthy man retains for hours the same temperature, in an atmosphere varying at least 200 deg. To what are we to attribute this increased evolution of animal heat, if it does not arise from the stimulating effect of cold. The range of temperature under which the powers of life will continue to resist the pernicious effects of cold; or in other words, under which cold will continue to excite the powers of life to more vigorous exertion, will depend upon the strength of the constitution, upon habit, upon the absence of any present cause of debility, &c.; of course it will vary greatly in different individuals, and in the same individuals under different circumstances. That it really does possess this power, is proved by the fact, that diseases unquestionably dependent upon debility, such as chlorosis, obstinate intermittents, &c., are every day cured by it.

With the views which the author entertains of the *modus operandi* of the cold bath, he of course limits its application almost to diseases which are accompanied with febrile action. He recommends it in those persons who are affected with nervous irritability, accompanied with increased sensibility to atmospheric vicissitudes, but not dependent upon visceral disease. Under these circumstances, the limited use of the cold bath, if the circulation be tolerably active, and the skin not habitually cold, will "blunt the acuteness of sensation by the sedative action of the cold on the nerves," and by increasing the density if not the actual thickness of the skin, cause it to "transmit less readily the impressions of cold and heat." Regular and active

exercise in such habits will efficiently co-operate with the use of bathing.

In that kind of nervousness which proceeds from dyspepsia, chronic disease of the liver, or protracted intellectual efforts with late hours, and is accompanied with headache, palpitations, the system is too much enfeebled to bear the sedative action of cold.

Cold bathing he asserts to be useful in persons of sedentary habits, in whom the skin is habitually hot and dry. Its good effects are assisted by moderate exercise, and especially by the use of the flesh brush.

It is not less useful to those who, notwithstanding the enjoyment of good health, are liable to colds, rheumatic and pleuritic affections, &c. The cold both checks the disposition to perspiration, and consequently removes the source of that debility which produces the susceptibility to the causes of disease He denies that the cold here can be considered as a stimulant because its "beneficial operation is evinced at a time when no stimulus or tonic is admissible, and in habits sanguine and plethoric, on whom nearly similar effects would be produced by a moderate bleeding and reduction of the usual quantity of food with diluent drinks." As fallacious a mode of reasoning as can well be conceived of. How often do we see one tissue or one set of organs laboring under debility while another is preternaturally excited. In such cases health may sometimes be restored either by reducing the system, or by applying an appropriate stimulus to the local disease; although in general the combined agency of the two classes of remedies is necessary. We do not say that this is strictly a parallel case, for the question is too complicated to admit of being settled in a very decided and positive manner, but such a solution has at least many probabilities in its favor.

The great field for the cold bath, according to Dr. B. is in the cure of febrile diseases. This practice, with the time and circumstances under which it is applicable, and the proper precautions under which it is to be used, is fully described by authors, in the hands of every physician. It has not, however,

by any means received the attention it deserves from the profession at large. We shall not dwell further upon this part of his practice than to give his remarks upon its use in hemorrhage of the lungs.

"Physicians, participating in the notions of the vulgar, that the blood was driven to the internal organs by the application of cold to the skin, were long deterred from the free use of the cold bath in *hemorrhages*. Popular experience had very early shown the good effects of cold applications in bleeding from the nose,—and ought to have been sufficient to expose the fallacy of this hypothesis. Still, the extended use of the remedy to other forms of internal bleeding was exceedingly slow, and looked upon as hazardous in the extreme. Reasoning from the obvious phenomena produced by cold bathing which I have already detailed, we cannot, *a priori* fail to satisfy ourselves, that, consentaneously with the diminished action and temporary torpor of the skin, are similar states of the mucous membrane of the nose, lungs, stomach, intestines, bladder and uterus, on which, respectively, take place epistaxis, hemoptysis, hematemesis, mælena, hemorrhoids, hematuria, and menorrhagia.

In *hemoptysis* or spitting of blood from the lungs, the cold bath, so long deemed a hazardous application, has been tried by several distinguished practitioners with the best effects. The knowledge of its efficacy in this case has been gained probably in an empirical manner—if we consider the erroneous notions regarding the operation of cold on the internal organs. But all doubt ceases by our observing that, simultaneously with the torpor of the capillaries of the skin, induced by the cold bath, is that of the minute vessels of the pulmonary mucous membrane. The collapse of the extremities of the blood-vessels causes a necessary coagulum and a consequent mechanical obstruction to the flow of blood: there is, besides quiescence of the nerves—diminished or abolished sensation, and less afflux of blood to the part. It is obvious, however, that for the cold bath or ablution to be of marked benefit, it must be of so low a temperature and continued so long, as that it may exert a permanently depressing action on the hitherto morbidly excited capillaries of the lungs. If the remedy be of such short continuance to the skin as merely to suspend, without directly lessening the function of calorification in the part, and its vascular excitement, the reaction will be considerable, and the capillaries more distended than before. I have directed cloths, fresh dipped in well water, of 52 deg. Fahrenheit, to be applied to the chest of a patient afflicted with hemoptysis, and have witnessed the good effects of cold in arresting the flow of blood without any accompanying or subsequent inconvenience. Others have had sheets wet with cold water rolled round the chest. Giannini, among other cases, cites the one of a young man seized with spitting of blood, whom he caused to be immersed, for about a minute at a time, in water made colder

by the addition to it of ice; this operation was repeated three times in the twenty-four hours, and with a speedy and happy result. He very properly directs a preference to be given to the period of the fever, and of the flush accompanying the discharge of blood. But we need not necessarily wait for or expect always the cutaneous excitement. We must depress, beyond what is pleasurable or any ways comfortable, the cutaneous capillary tissue, in order to act sympathetically on the pulmonary mucous capillaries from which the blood is discharged. If by frequent returns of the hemorrhage, the patient have been much enfeebled, we may substitute affusion or ablution, in the manner already advised for immersion—to which Giannini recommends the additional treatment by frequent and copious enemeta of cold water, and cold acidulated drinks. Currie says, that he has found hemoptysis may be stopped by immersing the feet in cold water, and perhaps this may be done still more certainly by a permanent application of cold to the genital parts. He found the most powerful effect to be produced by immersing the body up to the pubes in cold water, a practice which, he adds, he can from experience speak of as often safe and efficacious in this disease.

If any doubts of the fallacy of the common hypothesis, which supposes a driving of the blood from the external to the internal parts, and from the extremities to the trunk, when cold is applied to the skin or to the feet, should exist in the mind of the reader, they ought to be dissipated by the cases mentioned by Currie. Immersion of the feet, or of the lower extremities entire in cold water, should, according to vulgar belief, by repelling the blood from these parts, precipitate it with increased force and quantity on the chest and head, and aggravate rather than benefit in hemoptysis and epistaxis. That very different effects result is at once a proof of the false doctrine so long prevalent on this subject, and evidence of the correctness of the view which I endeavor to inculcate."

These views upon the subject of the similar state of the evacuation in the different tissues of the body is the doctrine that has been uniformly advocated in this Journal. The opinion that the circulatory system, is not an inanimate conduit whose equilibrium is liable to be perpetually deranged, and whose contents, in consequence, are in danger of accumulating in one part at the expense of the rest, but, is intimately united by a common sympathy which has a tendency to cause every part to assume both the kind and degree of morbid action which prevails in any one part, appears to us to be the view that is best supported by attentive observation of the history of diseases. This subject is the more important because it is not, as are many of the

opinions which divide the medical world at the present day, a question destitute of practical importance, but has now, and has always had an important influence upon the practice of medicine.

The cold bath has been used with advantage in many convulsive diseases, as in chorea, epilepsy, &c. But only when some degree of inflammatory action was present.

Chapter IV. is devoted to *sea-bathing*. Among other grounds of difference between the effect of bathing in the sea, and in the common cold bath, the most important are "the slower evaporation of a saline than of a simple aqueous fluid," and, "the incrustation on the skin of saline particles, and the consequent stimulus which results therefrom, when the body is subjected to the common friction of the apparel." It is a fact well known to many persons, and abundantly attested by navigators, that persons exposed to the inclemency of the weather, suffer less from being drenched with sea-water than from being soaked in the rain. Dr. Currie attributes this to the stimulating influence of the salt held in solution. Dr. Bell says that any influence of this kind is imaginary, or if there be any, it is to be sought for in the slower evaporation of the salt water, and the consequent less degree of cold produced by it. The stimulus of the salt is produced, he thinks, only from the deposition upon the skin after it is dried. Upon this subject we are much rather inclined to adopt the opinion of Dr. Currie. No individual, we think, who has been accustomed to recommend the warm salt bath, can have failed to remark the much greater length of time that immersion in it can be borne, a circumstance that can be explained only by the supposition that, while still in solution, it exerts a stimulus upon the skin very different from the relaxing influence of the warm bath.

The influence of sea-bathing upon the animal economy is dependent upon many other circumstances, as climate, season, exposure, and exercise, &c. which serve very much to modify its effects, and for the most part to enhance its value. The general principles, however, for its application are the same.

As to the proper time for bathing, the early part of the day is, perhaps, on the whole, the most appropriate. It should never be resorted to when the heat and action of the body is below par, after being exhausted and debilitated by exercise for several hours, nor after a full meal.

Those who are accustomed to bathing, know well, that the reduction of temperature is much greater when exposed to the air, after leaving the water, than from continued immersion. Those persons, therefore, who have any thing to apprehend from the debilitating effects of the cold bath, would do well to continue in the water for some time, rather than have recourse to repeated immersions. Such persons should dry themselves as speedily as possible and resume their apparel.

After leaving the bath, moderate exercise serves to promote re-action, and to equalize the circulation. If an individual has used the bath at an improper time, or under improper circumstances, and coldness and shivering remain for a considerable time accompanied with languor, the invalid should retire to bed, and endeavor to produce re-action by friction and external warmth, especially to the pit of the stomach, and by drinking some aromatic infusion.

Among the diseases which are relieved by sea-bathing, the author enumerates dyspepsia, hypochondriasis, with their numerous associated ailments, such as sick head-ache and palpitation of the heart, hysteria, chlorosis, chorea, asthma, when not purely of the nervous kind, and slow fever. As a general rule the author thinks it will only be successful in curing these diseases when they are accompanied with a hot dry skin and an accelerated pulse, or when there are daily paroxysms of this kind. Females, with a cold and phlegmatic habit, or exhausted by a prior disease, and who are clear of fever, will only be injured by sea or cold bathing.

For a great variety of useful facts and remarks upon the subject of sea-bathing, we must refer to the author himself, simply remarking, that however valuable it may be as a remedial agent, it is by itself, unless the necessary precautions and subsidiary means are assiduously employed, likely to do very little

good, and perhaps is more likely than almost any other agent to be so perverted or misapplied by the invalid as to have a pernicious influence.

Chapter VI. is devoted to the warm bath. The range assigned to this bath by the author, as we before remarked, is between 92 and 98 deg. The highest extreme of this range will be grateful to those, the temperature of whose bodies from natural or accidental causes, is below the healthy grade. The lowest and from that to 85 deg. will be the range of that indefinite temperature called tepid or milk-warm, which is best adapted to persons of health, for the purposes of cleanliness, or for relaxation from fatigue.

The author strenuously recommends to the imitation of the inhabitants of the cities of this country the example of those nations, both of ancient and modern times, who established public baths for the convenience of the citizens generally. The salubrity of the practice, the importance of habits of cleanliness, not only to health but to good morals, certainly render it a subject worthy of the consideration of the legislator. Whatever reception a proposition of this kind may meet with from the public, a bath should undoubtedly form a part of the furniture of every family. If the luxury itself were not sufficient to recommend it to universal use, the high recommendation of such men as Franklin and Bacon, and the beneficial influence it exerted in renewing the vigor of their youth at a very advanced age, ought at least to entitle it to consideration.

The most important of the effects of the tepid bath are, to allay irritation, to increase absorption and exhalation—to diminish the frequency and increase the fulness of the pulse. Hence it is useful to relieve fatigue—to procure sleep—to remove a dry and husky state of the skin, and restore its natural secretions. It is useful also in all those diseases which have their seat in morbid sensibility, or obstructed perspiration; mania, convulsions, colic, cholera infantum, dysentery, diarrhœa, croup, catarrh, asthma, diseases of the skin, rheumatism and gout, mercurial disease, &c.

There appears to prevail a very general idea that the warm

bath debilitates when continued for any length of time. This effect depends entirely upon the temperature; for if the proper medium be observed in this respect, the bath may be continued for hours without superinducing any debility.

The hot bath is peculiarly applicable where there is great torpor and want of action, either generally or locally. In cases of plethora, and especially where there are symptoms of determination to the head, its use is attended with great danger. The heat of the bath should never transcend that of the human body, or the indirect debility which results from its use, may be productive of serious consequences.

Most persons entertain great apprehensions respecting the consequences of going suddenly from a very warm to a very cold medium. These consequences, however, only result when the heat has been so long continued as to relax and debilitate the system, and impair its power of generating animal heat. If it has not been pushed to this extent, an individual may pass with impunity from the hot to the cold bath, and will be better enabled to resist the cold in consequence of being previously subjected to the hot bath, but the use of the former will obviate many of the unpleasant consequences which some constitutions experience from the use of the latter.

The remainder of the work contains some valuable chapters on the subject of *Vapour Baths*, *Mineral Waters*, *sulphurous* and other *fumigations*, the whole of which we cordially recommend to the considerattion of the profession, with a firm persuasion that all who read them will feel themselves liberally repaid by the amusement and benefit they will derive from the perusal.

ART. VIII.—*Dyspepsia Forestalled and Resisted; or Lectures on Diet, Regimen, and Employment. Delivered to the Students of Amherst College.* By EDWARD HITCHCOCK, Professor of Chemistry and Natural History in that Institution.

In searching for a definition to characterise the Lord of this lower world, philosophers have differed greatly in the point they have assumed as the basis of their classification.

If, in the absence of a better appellation, we were to call him a *Physic-taking animal*, we presume the species would so generally respond to the name, that the rare exceptions would serve only to give force to the general rule. The instances of men who have died without taking physic are, we venture to assert, far more rare than of those who lengthen out their span to twice the period allotted to man by the inspired penman. Scarcely has the little infant made his appearance into this world of disease, than the business of drug-taking commences; nor is the case better if he has the good fortune to make his entrance under the auspices of those whose happy experience has taught them to look upon the whole business of doctoring as a regular system of fraud and plunder. The practice thus happily commenced at the opening of life, is vigorously prosecuted through the whole term of mortal existence, until it is finally brought into requisition, with all its vain pomp and circumstance, to grace the closing scene, and carry the victim to the grave with decency. This final tribute to the Doctor's art is one that is almost never omitted, and however unceremoneously he may have been denounced during life, the mouldering remains of the poor mortal could scarcely repose in peace beneath the clods of the valley, if the rights of Esculapius were not celebrated over his dying pillow.

Is this tendency to disease, an evil inseparable from humanity, the tax that man pays for his intellectual superiority? We trow not. Nature has bestowed upon man a power of resisting the effects of noxious agents, and a facility of accommodating himself to the most injurious extremes, that is possessed by no other animal. His liability to disease, therefore, can be explained only by the fact, that he alone, of all other animals, pursues a regular system of cultivating his sensual appetites for the sordid pleasure of gratifying them. We are compelled, therefore, to make the reluctant, and somewhat mortifying acknowledgement that our honorable profession lives upon sensuality—that it thrives upon intemperance, and grows fat upon gluttony.

Since the importance of our profession is such that it cannot well be dispensed with, we are not unwilling it should be sup-

ported at the expense of those who seem to be born only to consume earth's fruits and die; but we should like to see the honorable few who stand forth as the representatives of the moral and intellectual dignity of our race, free from the ravages of that lurking and insidious Proteus, called dyspepsia, which under one form or another, is assaying the constitution of every good liver in this country, and we might say, throughout the world. Good old Seneca's maxim, "He who lives according to nature is never poor, while he who lives according to fashion, is never rich," does not require the aid of a figure to make it strictly applicable to health. Temperance and industry will enable man to bear the vicissitudes of every clime where there is any thing worth living for, and without them the greatest profusion of the gifts of Providence can never make life worth the possession.

We know of no subject upon which a manual placed in the hands of every body, would be more useful than one upon the subject of temperance—temperance we mean not in drinking—not in eating only, but in every thing—in our labor and our rest—in our study and our amusements. We have no doubt that 99 out of 100 of the actual diseases that infest the human race may be traced to intemperance under some shape. Is a man heavy, or dull, or lazy, or low spirited, or irritable, or passionate, or sick? he may depend upon it that he is habitually or occasionally intemperate, habitually or occasionally guilty of something which a rational man ought to be ashamed of,—either in eating or drinking, smoking cigars or chewing tobacco, or lying in bed in the morning, or something else which he ought to be ashamed to avow.

Among the heathen moralists temperance was a cardinal virtue—a part of their religion. It would be very desirable if its importance were equally well appreciated in our degenerate days. Believing that if it were, the cause of private happiness would be incalculably advanced, we cannot do otherwise than recommend this little work to general attention. F.

Miscellaneous Intelligence.

ANALECTIC, ANALYTICAL AND ORIGINAL.

I. ANALECTIC.

1. *Process of preparing pure Muriate of Morphia.* By Montgomery Robertson.—"Having now finished my illustrations of its Medicinal effects in a state of purity, I shall direct the attention of my readers to what appears to me the best mode of securing this, and the readiest method of ascertaining it. And as I intend subsequently, to point out a way of obtaining, not the muriate only, but any other salt of Morphia, in a state of purity, and in as far as its individual composition will allow, of uniformity also; I shall take a brief view of former processes, that the value of the improvements may be more clearly seen.

"Until the introduction of the muriate into medicine, the salts of morphia were prepared on a plan divisible into four stages; which had for their ostensible objects, the separation of the active from the inert principles,—the isolation of the morphia,—its decolorization,—and its combination with acids. The first was accomplished by dissolving the salts contained in opium,—the next by decomposing them with an alkali,—the third by treating the precipitate with charcoal and alcohol, and the last by dissolving the product in an acid. Latterly, comparative purity had been obtained by decolorizing a salt of morphia, which was afterwards decomposed to procure the Alkaloid for recombination. The first step has been effected at different periods by means of water, hot or cold, acidulated or plain; or lastly, by fermentation. In whatever way it is made, the infusion contains a free acid, more or less resinous coloring matter, solutions of morphia and of narcotine. The three last, intimately blended, are thrown down on the addition of ammonia; animal charcoal, and repeated crystallizations in alcohol, remove the coloring resin; but the narcotine passes untouched through all these ordeals, and from its similarity to morphia, has been generally mistaken for it. This impure product being dissolved in the acetic or sulphuric acids, the liquid is evaporated to dryness; and thus the narcotine remains mixed with the resulting salt, either in a crystalline form, (if, as Robiquet asserts, it be crystallizable,) or in the shape of a transparent coating, enveloping its particles.

"Some chemists, indeed, as Merk and Wittstock, have, by ingenious and expensive processes, obtained morphia perfectly pure. But I speak of the alkaloid as it is generally manufactured; when the object of the pharmaceutist being merely to procure a saleable article, purity is little valued, and not particularly sought after, when it is obtained at the expense of considerable diminution in quantity.

"It is easy to observe that the complication of treatment which these processes require; the combinations, decompositions, solutions, and crystallizations which they enjoin; the evaporations and filtrations which they direct, cannot be completed without considerable expense of time, labor, and material. But by introducing into medicine the muriate of morphia, and publishing a mode of preparing it, Dr. Gregory rendered the latter part of these processes useless, and abridged much that was tedious and objectionable. I have now to propose an improved method; which, by curtailing still further the necessary operations, will render the preparation of the muriate, much more easy and economical.

"This process has for its prominent feature the employment of *double* decomposition; a plan which secures at one step the separation of the meconic acid,—and the union of the morphia with muriatic acid. The liquid employed to effect this decomposition is the muriate of lime; an article whose cheapness renders economy in its use no object. Perhaps in other places, muriates may be found more suitable, for other reasons, but this one seems to me best calculated to enable us to procure, on the one hand the meconic acid free from color, on the other the muriate of morphia free from narcotine.

"The first step of the process resembles that of all others, in as far as the active principles of the solution is concerned. The opium, cut in pieces, is macerated at a temperature not exceeding 100 deg. F.; as it softens, it is worked up into a pulp, and frequently stirred during the course of exhaustion; the infusion, as it becomes saturated is drawn off clear, and may be immediately subjected to evaporation.

"This evaporation is conducted in a large vessel of tinned iron; and a sufficient quantity of marble, in coarse powder, is added to saturate the free acid. The muriate of lime used should contain no iron, lest, in combination with meconic acid, it give a deep color to the liquid, difficult to be got rid off, and the quantity required for each portion of infusion, is best learned by experience. When the infusion has reached the consistence of syrup, an excess of muriate of lime is poured in, and the boiling is continued for a few minutes longer. Then the whole may be emptied into a large basin, and when cold diluted with water, until a copious separation of resinous flocculi take place. In this way most of the meconate of lime, which is nearly insoluble, and a great quantity of coloring matter, are got rid of; the separation of the latter being more copious and complete, the more concentrated the liquid is before dilution, and the nearer that dilution approaches to a certain point; after which, further dilution causes the flocculi to be partially redissolved, and to render the filtered liquid turbid.

"When these flocculi have subsided, the clear part is evaporated as far as possible, on a sand-bath, a small bit of marble being put into each dish to neutralize any free acid, and the fluid being poured off the sediment before it is permitted to crystallize. We may, at this stage, prove whether enough muriate of lime has been added, by trying if a little of the clear liquid will, aided by heat, separate meconate of lime from an equal bulk of concentrated infusion. When about to consolidate, it is stirred into a uniform mass, from which, enclosed in a stout cloth, the dark fluid is expressed as completely as possible. The cake of impure muriate is dissolved in water at 70 deg. F., and the solution filtered through cloth; whereby a large quantity of impurities will be separated without loss; the liquid, to which a small portion of muriate of lime is added, is now ree-vaporated, neutralized, and treated in other respects as before. In the next evaporation the liquid, now completely free from meconate of lime is slightly acidulated; a judicious suggestion due to Dr. Gregory, who has observed that the acid renders the coloring matter more soluble, aud thus more completely separated, when the product is expressed for the third time. The muriate, which is now of a light brown color, is next dissolved in boiling water carefully neutralized with chalk, and mixed with animal charcoal; which, provided it do not contain a free alkali, requires no purification. Fresh portions of hot water should, from time to time, be added, until there is enough to keep the salt in solution, when the liquid cools; and the whole is to be frequently stirred, that the most may be made of every particle of charcoal. The temperature should not permanently exceed 190 deg. F. lest any of the muriate be decomposed. If the charcoal be good, and in sufficient quantity at the same time that the liquid is dilute, and frequently agitated, twenty-four hours of contact is sufficient to decolorize it so far, that on the addition of a little acid to the filtered liquid, it becomes almost colorless. This effect produced on the color by the addition of an acid, (any acid will do,) I cannot explain. It was first observed by Dr. Gregory, who has also remarked that muriatic acid added to a neutral solution of muriate of the specific gravity of 1.020, when cold, and in which there is no appearance of crystallization, causes it in a short time to become a mass of crystals, which, when dried in the air, are perfectly neutral.

"The mass that results from the evaporation of the decolorized liquid, is subjected to pressure in portions of about six ounces each, tied up in well washed cotton cloth; the superfluous ends of which are cut off, in order to prevent them from making the surface of the cake irregular. They are next put into a stove heated to about 100 deg. F. where they remain until almost dry, when the cloth is removed and the colored surface scraped off. After being pounded and dried, *till no more weight is lost* at a temperature of 150 deg. F. The muriate resembles chalk in color and appearance, is permanent in the air, and is fit for medical use. If a little be now dissolved in distilled water, and pure potash added, crystals of morphia are presently separated, which are completely dissolved on the addition of an excess of the alkali,

the absence of the characteristic milkiness, changed by heat to woolly flocks, indicating a total freedom from narcotine. A very few colored flocculi may remain, so inconsiderable in weight as to be of no moment, and totally removed by filtration; as in any remaining yellow tinge by a fresh crystallization, if the liquid be previously well acidulated.

"In this process, if well conducted, the loss by manipulation is trifling. The whole of the morphia is separated in a solid form in the first and second crystallizations, provided there be present in the liquid a slight excess of muriate of lime, and the evaporation be carried far enough. The great deliquescence of the muriate of lime apparently facilitates the completeness of this separation. The dark liquids expressed on these two occasions may therefore be deemed void of muriate; the mother liquids of future crystallizations, as well as the water in which the cloths have been rinsed, are added to a portion in an earlier stage of advancement, and the colored particles scraped from the cakes, may be joined to that about to be treated with charcoal, it is absolutely necessary that all the neutralizations be made without lime, (marble will not decompose the warm liquid, nor chalk the cold,) —that all the evaporations be carried as far as possible before setting aside to crystallize—that the mass be always stirred when consolidating—and that the mother liquids be expressed very completely from the crystals, enclosed in cloth. The charcoal does no good until most of the resin be separated, and leaves a dark tinge in the liquid, only to be removed by acidulating. A moderate excess of muriate of lime is proper, too much renders the mass clammy, and the mother liquid difficult to express; too little causes the decomposition to be incomplete, and the muriate that is formed refuses to crystallize; but these errors are easily remedied.

"In the last experiment that I made, 54 1-2 lbs. Avoird. of good opium were macerated at once. This quantity had lost one pound and a half of its weight previous to infusion, by standing for three months in the laboratory, having been previously reckoned 56 lbs. From it were obtained, by the process just described, 91 1-2 ounces troy of muriate, or rather more than 11 1-2 per cent. Several accidents happened during the preparation, from the breaking of dishes; besides the opium was not completely exhausted, nor were the mother liquids collected with due regard to economy, or I have no doubt the other half per cent. might easily have been made out; and 12 per cent. is in my opinion the utmost that can be expected from ordinary opium, losing from 8 to 9 per cent. by drying. The cost of manufacture, including the price of the opium, &c. amounted to 17s. 6d. the ounce troy. This then may be reckoned a fair trial of its success on a large scale.

"With regard to the adulteration of this article, for I fear that adulteration, though easy of detection, will still be attempted; the most likely manner of increasing its weight will be, not to deprive it completely of moisture. This may be detected, simply by ascertaining how far heat lessens the weight of a certain number of grains, and

druggists are entreated to take particular care to avoid using muriate that is not perfectly dry; as this, which may proceed from accident as well as design, is, more than any other cause, likely to impair the uniformity of its preparations. In the state of powder it may, perhaps, be mixed with chalk, magnesia, starch, carbonate of baryta, sugar, and other white powders; a species of adulteration which may be completely prevented by preparing it in crystals. But as this requires more time and manipulation, I may here observe, that all insoluble powders are detected by its solubility in hot water, starch by iodine, and sugar by the taste, and the form of its crystals on evaporation. I may here too mention, that I have seen in chemical works, particular cautions given to avoid the fumes of boiling infusions of opium, as if they were highly deleterious. But though engaged for several months in examining the component ingredients of opium, and though I have been exposed for hours, together with the concentrated vapors of infusions, I have never experienced the slightest inconvenience therefrom; nor do I believe there is the least particle of narcotic principle contained in them.

"These are all the particulars I have to mention with regard to the manufacture of the muriate of morphia. I come now to describe a method, by which any other of its salts may be prepared in a state of purity, from crystals of impure morphia.

"For the principle on which this process is founded, I am indebted to M. Buisson of Paris, who states in his Thesis, that the salts of ammonia are decomposed at an elevated temperature, by the salifiable vegetable bases. On trial, I found that morphia, boiled in a salt of ammonia, displaced the volatile alkali, while narcotine had no such power; and that when morphia, mixed with narcotine, was boiled in muriate of ammonia, until no more ammonia was driven off, the narcotine was left undissolved in the form of powder, while the morphia had disappeared. In order then to form a pure salt of morphia from a mixture of the alkaloids, I boil them in a little distilled water, dropping in, carefully, a neutral solution of the acid in combination with ammonia, until, on a further addition, no more fumes of ammonia are exhaled. The liquid is then filtered to separate the narcotine; the morphia may be obtained by precipitation. It is proper to remark, that the crystals must be tolerably free from resin, in order that a perfect separation take place; and that the coloring matter, also, seems to have the power of decomposing the ammoniacal salt. This process may be hereafter useful in rendering narcotine pure, a principle, which, it is probable, will, ere long become more esteemed in medicine, than it has hitherto been. It may be modified in various ways to suit the convenience of the operator, and is a great aid in the examination of small portions of opium; as in estimating the value of a sample.—*Ed. Med. and Surg. Journ. April*, 1832.

2. *Poisoning by Colchicum.* By Thomas Ferredy.—David Cole, æt. 44, a stout, muscular man, feeling pains in his bowels, to which he was subject, about six o'clock in the morning of the 8th of March last,

swallowed, believing it to be rum, about two oz. of wine of the seeds of colchicum. He immediately discovered his error, but, knowing its effects in a small dose, conceived it would be followed by vomiting and purging sufficient to avert mischief. He sought no medical advice until four in the afternoon, when I first saw him. He was sitting in a chair, his elbows on his knees, and told me that he felt no inconvenience for an hour and a half after taking the dose, when pains in the bowels came on, but that he continued his labor until eleven o'clock, when pains in his stomach and bowels, retching, and copious vomiting of a yellowish fluid compelled him to desist.

Four o'clock, P. M.—He describes the pain in the epigastrium as agonizing, and says it is like a knife piercing him. The retching is incessant and extremely violent, but no fluid is evacuated; there is tenesmus; a small quantity of fæcal matter only has passed. No tenderness upon pressure either in the epigastrium or abdomen. The appearance of the tongue is natural, the pulse small, slow, and feeble; breathing not much affected; the feet cold; his countenance is anxious; features sharp; his cheeks, lips, and palpebræ, purple. Upon attempting to walk, says he thinks he shall lose the use of his limbs, A mustard emetic was given, followed by copious draughts of warm water and gruel. These were soon returned, with apparently no mixture. Cathartic medicine was given, and immediately returned. Was put to bed; warm bricks were applied to the feet, and hot flannels to the stomach. To take forty drops of laudanum immediately; gruel and coffee plenteously.

Nine o'clock, P. M.—The retching, vomiting, and pain in the stomach, continue with undiminished violence; the fluid vomited contains a sediment like coffee-grounds; very thirsty, has made little water. Twenty drops of laudanum every two hours; a blister to the epigastrium; sinapisms to the feet; an enema every hour.

9th—Six o'clock, A. M.—Has passed a sleepless night; the symptoms remain unaltered. The eyes are sunk; the feet warmer; skin generally natural; no perspiration; pulse scarcely to be felt; respiration hurried; great thirst; no urine. Enemata returned without fæcal matter. Camphor, calomel, and opium every three hours; an effervescing draught, with brandy, every hour.

Eight o'clock, P. M.—The retchings and pains continued until four o'clock, when the bowels were much distended. Has since had copious liquid stools, dark colored, and very offensive, and expresses himself better. Makes a few drops only with urine; loses his sight for a minute or two after getting out of bed to the night-chair. The pulse is scarcely perceptible and occasionally intermits. He is perfectly sensible, but talks with effort; calls continually for water.—Aromatic confection, carbonate of ammonia and camphor mixture, with brandy, every hour.

10th.—In the course of the night his stools passed involuntarily, and in great numbers; his weakness increased, and he died a few minutes before five oclock this morning, perfectly sensible to the last moment.

Sectio Cadaveris.—The face, neck, upper and front part of the thorax, insides of the arms, front of each fore-arm, and the insides of the thighs were covered with patches of a purple efflorescence, as were also the integuments of the scrotum and penis. The muscles of the fore-arm were very rigid, and their fibres contracted into hard knobs. The great omentum, instead of covering the front of the intestines, was turned up between the stomach and convex surface of the liver behind, and the diaphragm in front, from the effects of vomiting. There was increased redness in a portion of the peritoneum covering the jejunum. The stomach and bowels were covered with a thick, tenacious, but colorless mucus. On a portion of the mucous membrane of the stomach, near the cardiac orifice, and corresponding to its great arch, was a patch of redness about the size of a half-crown piece; its secretion here did not vary in tenacity, quantity, or color, from that of any other portion of the membrane. Upon dividing it at this part, its section presented nothing beyond its usual appearance; there was no pulpiness, no thickening, but a small quantity of blood was effused between it and the muscular coat, giving a reddened internal appearance. Careful examination of that portion of the reddened peritoneum covering the jejunum demonstrated the like hæmorrhagic condition of the blood-vessels. Blood was effused between the peritoneal and muscular coats, but the mucous membrane corresponding to this portion was perfectly healthy—at least it was perfectly free from inflammation. No other trace of inflammation was observed in any other portion of the abdominal viscera. The gall-bladder was distended with healthy bile: the urinary bladder was contracted and empty.

The pleuræ costales were much reddened. The lungs were of a most beautiful purple color externally, did not crepitate, and were gorged with black blood, which had become effused, underneath the pleuræ pulmonales, in spots of various sizes; these were very numerous about their roots and edges.

The pericardium contained no fluid, nor was it reddened, yet numbers of ecchymosed spots were observed in that portion of it attached to the central tendon of the diaphragm, and also thickly interspersed on the surface of the heart itself, more especially about the centre of the coronary vessels. Heart flabby and easily broken down. The cavæ, the right oracle and ventricle, and the pulmonary artery, were filled with black blood, partly coagulated, partly fluid; the left auricle and ventricle empty.

I regret that neither my own entreaties nor the influence of the coroner were sufficient to obtain permission to examine the head. So little were the functions of the brain disturbed during life, that it is probable no other diseased appearance would have been observed, save a participation of its sinuses in the distension of the right side of the heart.

The deleterious effects of the bulb of colchicum are said to depend, in a great measure, upon the season of the year when it is collected; but the seeds matured only in the spring, must possess uniform properties.

Colchicum is classed, by most writers, as an acrid or rubefacient poison, and poisons of this class are defined as producing inflammation when applied to the intestinal canal, and, if taken in sufficient quantity, the same effects as the corrosive. No such effects however, followed its exhibition in this case; for, in addition to the want of the usual postmortem appearance of inflammation, I consider the patches of redness in the stomach and peritoneum, too partial for inflammation from such a cause. The jejunum, too, possesses a singular immunity from disease as is shown by the quotation of Andral's table, in Macintosh's Practice of Physic. The hæmorrhagic condition of the system, observed here, accords with the observations of Dr. A Thomson, published at p. 281 of the Lancet for 1831, who says, that colchicum has an effect of producing effusion of blood from all the mucous tissues, the skin alone excepted, and that a peculiar laxity is observable in their cellular membrane, producing a diminution, if not total destruction, of its adhesive powers. The purple efflorescence of the skin, the effusions of blood between the coats of the stomach and the jejunum, and underneath the pleuræ and the pericardium, in this case, all prove the accuracy of these remarks. I feel satisfied that not the slightest inflammation existed in either of the above-mentioned structures; for, with respect to the stomach and bowels, where redness was perceptible, the mucous membrane was unchanged in structure; there was neither pulpiness nor thickening, nor did it present a more vascular section than other portions of the membrane: a very important observation, too, its secretion was not changed in quantity or consistence. With respect to the lungs it was difficult to trace, or rather dtstinguish, either blood-vessels or bronchiæ; a section of them seemed more like the section of a clot of venous blood, so greatly were they congested with black blood. The state of the breathing during life bore no kind of proportion to this appearance.

Colchicum is also classed as a poison acting upon the nervous system by absorption, and, through this medium, exerting a peculiar influence on the arterial circulation; and this appears to be its true modus operandi. Sir Everard Home found, by direct experiment, that its effects were the same, whether taken into the stomach or introduced into the jugular vein, only that, in the latter case, its effects were more quickly developed than in the former, and hence he concludes that its action upon the different parts of the body is through the medium of the circulation and not from its immediate effects upon the stomach and intestines. The primæ viæ have been frequently, and perhaps generally, found inflamed, where colchicum has been taken in large quanties; but this is no proof of its *direct* effects upon them, since arsenic will produce inflammation there (the stomach and bowels) when applied to the external surface of the body! Sir Everard Home found that colchicum reduced the pulse in all cases where it was ordinarily used, and this is a material help in enabling us to trace the order in which the three great functions of the body are severally affected by it. It would seem that the heart is deprived of nervous energy, and in consequence beats feebly. Now, by the natural pro-

cess of inspiration, the trachea and bronchiæ, with their minute ramifications, together with the air-cells, are distended with atmospheric air—an elastic fluid. At the standard of health the heart contracts with a force probably three hundred times greater than the force exerted by the pressure of the air in the lungs; and the blood, instead of being impeded, flows more freely, hence the important connexion between the circulating and respiratory functions. We have seen that colchicum, in an ordinary dose, depresses the heart's action. What must then be expected to follow the administration of a dose like that in question? for it does not appear to be one of those remedies, the principle of whose action is altered by its dose. The action of the heart is almost paralyzed; it can no longer overbalance the pressure exerted by the air in the lungs; the blood can be no longer propelled as usual through their vessels; congestion takes place in the veins; the blood is unarterialized, (and whether its exposure to the action of the fibrillæ of the ganglial system of nerves, in its passage through the arteries, has any influence in effecting this essential change, the lungs are not able to exert their necessary preparatory action,) and unarterialized blood gradually destroys the action of every part through which it circulates. The organs of digestion, assimilation, circulation, and secretion, were severally deranged in function, whilst the intellectual and locomotive powers were little affected. This proves the great extent to which the sympathetic or ganglial system of nerves was affected, and the almost immunity of the cerebro-spinal system.

It must be obvious that no treatment in this case held out any hope of the patient's recovery. When first I saw him, he had swallowed the dose ten hours, when time had been allowed, over and over again, for it to enter the circulation. An emetic, or stomach-pump, employed before this had taken place, would have dislodged it, and probably have saved his life.

Since poisons act in so many different ways upon the animal economy, some primarily through the medium of the nerves, without being absorbed, producing death by suffocation from paralysis of the respiratory muscles, or by syncope—others by entering the circulation, and exerting their influence on the heart, brain, and alimentary canal—others through the same medium on the spinal marrow, and lastly, others having a purely local action on the mucous membrane of the alimentary canal—and since this difference through their physiological actions renders a plan of treatment safe and justifiable in some instances, which would be followed by the most tragic effects in others, it behooves us to be aware of the order of the parts of the system through which they exert their influence; for, as each has its own modus operandi, it is by a knowledge of this only, that we can arrive at scientific and safe indications of cure. Magendie, for instance, found that a state of depletion facilitated absorption, but that a state of congestion impeded it. How important a knowledge of this fact is in the successful treatment of two familiar poisons—arsenic and corrosive sublimate! Dr. Paris has classed the former with those poisons which produce their effects by absorption—the latter with

those having a purely local or corrosive action. Both are followed by inflammation of the primæ viæ; yet the experiments of Magendie teach us, that, if we deplete to subdue the inflammatory symptoms when arsenic has been taken, so long as any portion of it remains in the stomach and bowels, we necessarily hasten death by promoting its absorption. On the contrary, corrosive sublimate, having a local action, and not being absorbed, needs no such precaution: we may bleed from the outset.

The same principle is applicable to the poison of colchicum. It produces its effects by absorption. We should, therefore, be very cautious how we bleed, to subdue any inflammatory action of the stomach and bowels, until the poison is completely ejected from them.—*Bost. Med. and Surg. Journ.*

3. *Experiments with Narcotine.* Results of Experiments and Observations on Narcotine.*† By Wm. Tully, M. D. Professor of Materia Medica and Therapeutics in the Medical Institution of Yale College.—It is now many years since the discovery of that proximate principal of Opium commonly called Narcotine, and even a considerable number since it has been known to be capable, in certain doses, of destroying brute animals, with the phenomena usually produced by a *narcotic;* and yet I have no knowledge of any experiments or observations, hitherto, that can be considered as contributing much, if indeed any thing, towards the determination of its medicinal powers upon the human subject. As far as I know, most of the late writers upon Materia Medica have concurred in ascribing all the remedial properties of Opium to some salt of Morphine (another proximate principle of this drug), although it is admitted that Opium contains only about seven *per centum* of Morphine, and that a given quantity of Morphine is very far from being fifteen times as active as the same quantity of Opium, which ought to be the fact were Morphine its sole

* This article is re-published at the author's request, from the American Journal of Science for July. Some future numbers will contain a communication from Dr. Tully, prepared for this Journal, giving the details of these experiments.—*Ed. Bost. Jour.*

† It is well observed by a distinguished pharmaceutist, that the original ending in *ina*, (*ine* in English,) of the names of the vegetable salifiable bases, *must* be retained by physicians to the exclusion of the termination in *a* simply, or *ia*, which has been recently adopted by the chemists, since the similarity of *Atropia* to Atropa—of *Daturia* to Datura—of *Brucia* to Brucca—of *Sanguinara* to Sanguinaria—of *Cinchonia* to Cinchona—of *Gentiania* to Gentiana, etc. (the former of which are the present fashionable names for the active principles, and the latter the long established names for the vegetables from which they are obtained,) is altogether incompatible in prescription with the safety of patients. In all the editions of Magendie's Formulary—in Anthony Todd Thompson's Conspectus of the British Pharmacopœias—in Rennie's Supplement to the British and French Pharmacopœias—and (as has been said) in some of the latest Pharmacopœias of the continent of Europe, the termination in *ina* is retained, it was to be hoped that the responsibility of a useless change in nomenclature which, if adopted, would endanger so many lives, would never be assumed by any practitioner of medicine.

medicinal principle. According to the best observations, a given quantity of Morphine, instead of possessing fifteen times the activity of the same quantity of Opium, can at most be considered as possessing only about four times the activity, and perhaps there is room for just doubt whether there is even as much difference as this. Now it cannot be reasonably supposed that as much as seventy-two *per centum* of the Morphine is lost, in the process for its separation from Opium, and therefore it is altogether probable, *a priori*, that there is another principle, upon which its virtues may in part depend, more especially as the Strychnos Nux-Vomica, and several species of Cinchona, are now well known to contain two principles, possessing medicinal powers, similar in kind, and differing mainly in degree. Nothing else beside Narcotine, and another very doubtful substance, called extractive matter, having, as is said, an intensely bitter taste, has yet been obtained from Opium, which can reasonably be suspected of contributing to its remedial effects.

For the purpose of ascertaining the precise powers of Narcotine, I have recently instituted a course of experiments, fourteen in number, upon healthy subjects it is true;* but they have afforded results much more satisfactory, and without doubt much more analagous to what will be its effect in disease, than could possibly be obtained from experiments upon brute animals, and especially upon those which have suffered the lesion of a ligature upon the œsophagus, immediately after being forced to swallow the agent whose powers are to be ascertained. As a detail of the experiments themselves, would probably be incompatible with this Journal of Science, it will be reserved for some journal exclusively medical, and this communication will contain only a summary of the results obtained by the experiments in question, preceded by a few definitions, which are necessary to show the precise acceptations in which I employ the terms that will be applied to the several operations of the Narcotine.

In regard to the subjects of my experiments, it is not necessary to make any further statements, than barely to say, that one was a young physician belonging to the State of Massachusetts—that another belonged to the State of New-York—that two others belonged to Connecticut—and that I was myself the fifth subject. The four gentlemen, above mentioned, happened to be in New Haven together, and at leisure for about a week, and they therefore volunteered their assistance in this business, entering into it with a degree of interest and zeal, which fully evinced that with them their profession is not viewed as a mere trade, to be followed only for the purpose of obtaining a support, or as a means of acquiring wealth, but is rather esteemed a liberal art, which they cultivate with much more generous and honorable motives. It may be proper to state in this place that I once made a series of experiments of the same sort, upon the Sulphate of

* It is altogether probable that the state of health may be taken as a medium state of susceptibility to the influence of this article. Under certain circumstances much more may be required, and under certain other circumstances, much less, in order to produce given effects.

Morphine; and that a subsequent employment of that article in my medical practice, has abundantly confirmed all the conclusions to which I then arrived—and it is true, has led to some others, which could not be obtained upon a healthy subject. The result of my experiments upon the Sulphate of Morphine, and of my subsequent observations upon its operation in disease, will be subjoined to this paper on Narcotine, as in some instances my descriptions of the effects of each, have necessarily been comparative.

Definitions. A *narcotic* operation consists of four parts, stages, or degrees, viz.

1st. An *antirritant* stage, in which morbid irritability andirritation, and irritative action generally—morbid sensibility, restlessness and jactitation, (when connected with a non-phlogistic, or a positively atonic condition of the system,) are allayed;

2nd. An *anodyne* stage, in which pain, (when connected with a non-phlogistic, or a positively atonic condition of the system,) is relieved;

3d. A *soporific* stage in which sleep is produced; and

4th. *Ultimate narcosis*; in which there is vertigo, headache, faintness, dimness or imperfection of vision, nausea, and retching, epigastric uneasiness, small and irregular pulse, cold extremities, cold, clammy, or slippery sweats, delirium, stupor, convulsions (either common, epileptic, or tetanic), coma, and death. I am confident, from multiplied observations, that all *narcotics* are necessarily *stimulants*.

A state of prostration, (not of exhaustion or debility, as is commonly, but erroneously supposed,) sometimes takes place, as an indirect effect, and rather a remote consequence, of a single dose of certain *narcotics*, too large for the susceptibility of the patient. This state is characterized by vertigo, nausea and vomiting on motion, and headache and faintness. Although these symptoms constitute a part of what I have described as *ultimate narcosis* takes place while a patient is under the fullest operation of the *narcotic* agent, and this sort of prostration takes place only after the direct effects of the *narcotic* agent have passed off, and it is rather a sequel than a direct effect of such an agent.

Different *narcotics* vary very much in the relative degree of each of these states or stages of a *narcotic* operation, which they respectively produce. Each state or stage of a pure *narcotic* operation, may be considered as a strictly sedative operation.

A *nervine* operation consists exclusively of four states, stages, or degrees, viz.

1st. A moderate antirritant stage, indicated by more or less relief of the same symptoms, that are obviated by the first degree of a *narcotic* operation. I do not suppose that the *antirritant* effects of a *nervine* are identical with the *antirritant* effects of a *narcotic*;—they appear to constitute distinct sorts of *antirritant* effects;

2d. The production of a peculiar calm, placid, and pleasurable sensation;

3d. The production of a peculiar preternatural wakefulness; and

4th. The production of more or less positive exhilaration, sometimes amounting to delirium.

Different *nervines* also vary very much in the different relative degree of each of these states or stages of a *nervine* operation, which they respectively produce; and many are altogether incapable of producing the fourth state, or stage in any appreciable degree.

Pure *nervines* may be pushed to any extent whatever, within the capacity of the stomach to contain, without producing a single individual of those symptoms which I have detailed under the denomination of *ultimate narcosis*, and without the least increase of the vital energies generally, or of the strength of arterial action, which is a test always adequate to the perfect distinction of pure *nervines* from pure *narcotics*, and pure *stimulants*.

It is very common to confound a *nervine* operation with a *stimulant* one; but they are perfectly distinct. All the parts of a *nervine* operation (as I have just said) may be produced without any increase of the vital energies, and without any increase of the strength of arterial action. Indeed, I have very often seen the fullest *nervine* operation connected with an extreme reduction of all the vital energies, and with such a diminution of the strength of arterial action, that the pulse could scarcely be felt.

A *stimulant* operation consists exclusively in a quickly diffused, and transient increase of the vital energies generally, and a similar increase of the strength of arterial action. *Stimulants* usually diminish atonic morbid frequency of the pulse; but, in perfect health, they usually, (though not invariably) increase the frequency a few beats. *Stimulants* also commonly diminish, in a slight degree, both morbid irritability and irritation, and irritative action generally; morbid sensibility and sensation; morbid mobility, restlessness, and jactitation; but they do this in a less degree even than the *nervines*, and still less than the efficient *narcotics*, and, as I think, doubtless in a manner different from either. Pure *stimulants* never produce the least trace of the last three states or stages of a *nervine* operation, nor a single symptom of what constitutes *ultimate narcosis*, with the occasional exception of nausea and vomiting, and perhaps headache, from the mere irritation of excessive doses or quantities; nor do they ever produce any condition at all analagous to the secondary and rather remote sort of *prostration*, which, I have already mentioned, as sometimes the sequel of too large a single dose of certain *narcotics*. These circumstances afford absolute tests of pure stimulant powers.

It must be remarked that *narcotic* and *nervine* powers are principally exerted upon the nervous system, while *stimulant* powers are mainly exerted upon the sanguiferous system; and, particularly, that the first three states or stages of a *narcotic* operation—the whole states or stages of a *nervine* operation—and a perfect stimulant operation, are by no means incompatible with each other. Thus, for example, a full and complete *antirritant* operation, as produced by Opium—a perfect *anodyne*, and a prominent *soporific* effect may take place at one and the same time, with a most decided increase of the vital energies generally, and of the strength of arterial action; and either or both of these operations may or may not be accompanied at one and the same

time, with all the states or stages of *nervine* operation. *Sedative* effects, then, are by no means, incompatible with *stimulant* effects. What is called *ultimate narcosis*, at least in any prominent degree, does in fact seem to be incompatible, either with positive *nervine* or *stimulant* effects.

The conjunction, at one and the same time, of full *stimulant* effects, with the three first states or stages of a *narcotic* operation, may be witnessed in a prominent degree by the use of moderate and uniform doses of Opium and Alcohol, at regular and short intervals, for a certain length of time, in any case to which both are appropriate remedies.

That *narcotic*, *nervine*, and *stimulant* operations, as here defined, are perfectly distinct operations, is abundantly proved by the fact that there are numerous articles which possess each individually, without any trace of the others; and the circumstance that two of these groups of effects, or even the whole three, are not unfrequently produced by the same articles, more or less proves their identity, than the circumstance that Tobacco is both *narcotic* and *cathartic*, proves that these two effects are identical.

Results of Experiments with Narcotine.

1st. In the same quantities, Narcotine is far less operative upon the human system than the Sulphate of Morphine, and even less so than Opium.

2d. Narcotine possesser the same degree of activity, when given pure and in substance, as in any other way tried, its virtues not being either enhanced or diminished by solution in oil, or in dilute Acetic Acid.

3d. From two to five grains of Narcotine appear to constitute a medium full dose, where only a single dose is to be taken; i. e. such a dose as will just fall short of producing any disagreeable effects in a person of ordinary susceptibility.

4th. One grain of Narcotine appears to constitute a medium moderate dose, to be repeated at regular and short intervals;—and three hours appear to constitute a medium suitable period of repetition for such a dose, for a person of ordinary susceptibility.

5th. Narcotine is much slower, though it is less prominent in its effects than the Sulphate of Morphine. The period required for the first manifestation of the several effects of Narcotine, is intermediate between that required for the effects of the sulphate of Morphine, and that required for the effects of Opium; and the period of their duration is intermediate between that of the effects of opium and that of the effects of the Sulphate of Morphine.*

6th. Narcotine appears to be more or less *nervine*. The general *nervine* operation of Narcotine, I think is decidedly less than that produced by sulphate of Morphine, but I am not certain that it is less than

* It is remarkable that Morphine, which is much more speedy in its operation, appears to be more permanent in its effects even than Opium.

that of Opium. Narcotine does not appear to produce any of that preternatural watchfulness, which so often results both from sulphate of Morphine and from Opium. From the circumstance that Sulphate of Morphine possesses this last-mentioned property in an eminent degree, and that Narcotine is destitute of it, it follows that the same property of Opium is dependent upon its Morphine, and not upon its Narcotine. In short the quality of the nervine operation of Narcotine is considerably different from that of Morphine, and consequently more or less different from that of Opium.

7th. Narcotine appears to be considerably diaphoretic, and it commonly produces more or less itching of the whole surface, which is first perceived, and is most considerable, on the inside of the thighs and about the nose.

8th. Narcotine is most prominently and most decidedly narcotic.

As soon as it begins to produce a decided effect upon the system, it occasions a very peculiar expression of the countenance, which is more easily recollected than described. There seems to be a peculiar elongation of all the features, and a kind of lateral shrinking of the whole face, which, together with the effect upon the eyes, and particularly the contraction of the pupils, more unequivocally indicates the operation of a *narcotic*, than any expression of the countenance which is produced within my knowledge by any other agent. While in the early stages of its operation, and before my family knew any thing of the experiments, one individual of them after another, noticed this expression, and made remarks upon it. One said I appeared as if about to be attacked with some acute disease—another inquired if I had got *Sick headache* to which I am subject) and each made some comment. Similar remarks were made to the other gentleman. One was met in the street by another physician, who immediately pronounced that he was under the influence of some active *narcotic*.

Narcotine very materially and very greatly reduces the frequency of the pulse; it allays very effectually certain sorts of cough; it occasions indistinct vision, or the sensation of a blur before the eyes; and when a person is strongly under its influence, it occasions a contraction of the pupils. It produces also a sensation of dryness and clamminess in the mouth, though it appears sufficiently moist to the eye; and it produces not only a change in the sound of the voice (while a person is under its influence), but likewise very considerable hoarseness. These effects occasionally take place quite early in this operation. It produces not only a considerable diminution of the natural excretion by the renes, but also a deficiency of contractile power, or torpor of the bladder.

Whether Narcotine is constipating or not, may perhaps be considered as somewhat uncertain, but it is most probable that it is so. While experimenting upon it, one of the gentlemen had a regular and daily alvine discharge; but on account of a much greater susceptibility, he took considerably less of it than the other gentlemen. On the contrary, one gentleman had none for three days, while taking it; and another gentleman had none for five and I think six days, while

under its use. Since the completion of the experiments, I have known it taken twice for a moderate diarrhœa, with perfect relief of the disease. It may, however, possess the power of relieving diarrhœa, i. e. of obviating morbid irritability, and irritative action of those muscular fibres, which produce the peristalic motion of the intestines, without being liable to produce constipation; i. e. to lessen healthy excitability, and natural peristaltic motion. The resin of the *Zanthorræa hastilis* operates in this manner.

The *antirritant* effects of Narcotine appear to be greater in proportion to its other powers, than the *antirritant* effects of Opium; and also, as appears to me, had the *antirritant* effects even of the Sulphate of Morphine. Its great power of diminishing the frequency of the pulse, seems to indicate this, as well as its power of allaying certain sorts of cough. No opportunity has occurred of testing the *anodyne* powers of narcotine. It will be obvious that this cannot be determined upon a healthy subject. The *soporific* effects of Narcotine appear to be considerably greater, in proportion to its other powers, than the *soporific* effects of Sulphate of Morphine, or than the *soporific* effects of Opium. The sleep produced by it, even when taken in a moderately excessive dose, is peculiarly calm, light, placid and easy; and even when it is the most intense, the subject of its influence is easily roused: and by voluntary bodily motion and exertion, he can easily keep himself awake, and apparently very much diminish its general influence upon his system—and yet, as soon as he sits down and remains quiet for a short time, its full influence speedily returns. During the deepest sleep produced by Narcotine, the respiration is light and easy, like that of a person in health, who has been some time perfectly at rest.

When the subject of its influence awakes spontaneously from the sleep which it produces he feels no heaviness, and nothing unnatural, but much as awakening in the morning from an ordinary night's rest, except that he has a slight sensation of dryness and clamminess in the mouth, a considerable hoarseness, diminished renal secretion, and diminished contractility of the bladder.

In a moderately excessive dose, in relation to the susceptibility of the system, Narcotine produces a mazy and confused state of the head, vertigo, nausea, and vomiting. Too large a quantity in the twenty-four hours, operates in the same manner. But the effects of a moderately excessive dose of Narcotine, are much less disagreeable than the effects of an excessive dose of the Sulphate of Morphine, or of Opium. The mazy and confused state of the head, and even the vertigo which it produces, are attended with a decidedly pleasurable state of the feelings; and even the nausea and vomiting which it occasions, are by no means distressing, and are far less unpleasant than the similar symptoms produced by Sulphate of Morphine, and by Opium. The nausea and vomiting which a moderately excessive dose of Narcotine produces, begin almost instantaneously, and terminate as suddenly; and, in a very short time, no sensations remain, which indicate that nausea and vomiting have occurred at all,—there is no violent straining, no weakness, soreness, or stiffness afterwards.

According to Magendie, and others, the *ultimate narcosis* of Narcotine is made up of the following symptoms, viz.: signs of fright; backward movements, with incapacity of advancing; frothing at the mouth; agitating or tremulous convulsions of the jaws; general convulsions of the common sort; tetanic spasms of the extensor muscles of the neck, throwing the head backwards upon the spine; a stupor, in which the eyes remain open, but from which the subject cannot be roused, and under which he dies in the course of twenty-four hours. These last seem to be the only effects of Narcotine that have been heretofore fairly determined, either in Europe or in this country, at least within my knowledge. It is obvious that these could not be verified on the human subject, nor is it necessary to know them, for the therapeutic application of this agent, in the treatment of human diseases. Magendie says that these effects are similar to those produced by fatal doses of Camphor; and what is remarkable, he pronounces them to be mere *stimulant* effects, and not at all indicative of any *narcotic* powers! I wish that Magendie had furnished us with his precise views of the nature of an *ultimate narcotic* operation, for I cannot conceive of a purer one than is indicated by this aggregate of symptoms. I venture to assert on the one hand, without the least fear of contradiction, that if no articles which are capable of producing effects of this general character are suffered to retain their place among the *narcotics*, our catalogue of this class of agents will become extremely meagre; and, on the other, that there is not a pure and unequivocal stimulant that is capable of producing any such symptoms.

9th. Narcotine appears to be altogether destitute of all *stimulant* powers, whether it is given in single full doses, or in moderate and uniform doses, at regular and short intervals. My attention, during the whole of my experiments, was particularly turned to the question of its *stimulant* operation; and in no case, while under its influence, was there the least perceptible increase of the vital energies, or of the strength of arterial action, or even of animal heat; nor was there any sensation of fullness of throbbing in the head; nor, indeed, did any symptom whatever occur, which could by any means be construed into an effect of this sort. On the contrary, there was invariably a great reduction in the frequency of the pulse, in two cases as great as twenty-six beats in a minute, and in none less than eighteen in the same time. In some of the cases, there was a decided diminution, both in the force of the pulsation and the fullness of the artery, and probably more or less in all, though in some it was so inconsiderable as to be of very little consequence. These effects, I repeat, occurred equally, whether the agent was given in single full doses, or in moderate and uniform doses, at regular and short intervals, and whether taken in substance or dissolved in dilute acetic acid, or in olive oil, the power of producing preternatural watchfulness, even were it possessed by Narcotine, would not indicate any *stimulant* properties, but rather mere *nervine* ones, which are entirely distinct. The power of producing vertigo, headache, faintness, nausea, vomiting, irregular

pulse, cold extremities, etc. is not the result of a *stimulant* operation, but of a *narcotine* one; and both Morphine and Narcotine are capable of producing all of these last effects, though Morphine more eminently than Narcotine. If these results can be considered as at all correct (and I cannot discover where there is any possible source of fallacy), the futility of what is called *denarcotizing* Opium, as a means of improving its medicinal operations, will at once be manifest. However, as the effects of Morphine and Narcotine differ considerably, not only from each other, but also from Opium, it is undoubtedly useful to have each of these proximate principles in a separate state, that we may be able the more accurately to adapt our remedial agents to the peculiar circumstances of a given case.

What quantity *per centum.* of Narcotine is contained in Opium, I know not.* As in a given quantity it is less active than Morphine, and even less so than Opium itself, no quantity of it, however large, will account for the full effects of Opium, upon the supposition that we are correct as to the proportion of Morphine. But I do not esteem it by any means impossible, that the *bitter principle* already referred to, as being called by the vague name of *extractive* (if indeed there is any such distinct principle), or perhaps some other part of this complex drug, may yet be found to contribute something to its medicinal effects. —*Bost. Med. and Surg. Jour.*

4. *Test for Mercury and its Salts.*—"The most delicate, perhaps, is that proposed by Mr. Sylvester. A drop of the liquid supposed to contain it is to be placed on a piece of gold leaf, or any piece of solid gold, and the point of a nail or pen-knife, or of any small piece of iron or zinc placed in contact with the moistened surface; if any mercury be present, the gold will immediately become white, where it is touched by the other metal, uniting with the mercury and forming a solid amalgum, which retains its white color after the fluid has been wiped off.

Put a piece of copper into a solution of any salt of mercury; and the copper will be dissolved, combining with the oxygen of the oxide of mercury and the acid with which it was previously united, while an equivalent quantity of metalic mercury will be precipitated.

Add a solution of potassa to a solution of salt of mercury; oxide of mercury will be immediately precipitated. If the mercury in the liquid shall have been in the form of a protoxide, the precipitate will be of a dark color, but when it contains the peroxide alone, the precipitate has sometimes a reddish color, but is generally yellow, the peroxide disengaged combining with a portion of water and forming a hydrate. Collect the precipitate on a filter, dry it, and expose it to heat at the bottom of a small test tube over a spirit lamp, when globules of metallic mercury will be seen.

* It has been said (upon how good authority I cannot decide,), that Opium usually contains about twice as much Narcotine as Morphine.

Put a small quantity of a solution of a salt of the protoxide of mercury into a glass and fill it up with lime water; the protoxide of mercury will be immediately thrown down and give a dark color to the liquid.

Into another glass put a similar quantity of a solution of a salt of the peroxide of mercury, and add lime-water as before; the solution will become of a yellow color from the separation of peroxide of mercury in combination with water.

Add some sulphuret of ammonia, or pass a stream of sulphuretted hydrogen gas through a diluted solution of mercurial salt, a copious black precipitate will be thrown down of sulphuret of mercury, probably in combination with water.

Add a solution of the muriate of tin (muriate of the protoxide) to a solution of the salt of protoxide of mercury; a copious ash-grey colored precipitate will immediately appear, consisting principally of metallic mercury, the oxide of tin combining with the oxygen with which the mercury was previously united, and passing to a higher state of oxidation.

A solution of the ferrocyanate of potassa gives a white precipitate with salts of mercury; muriatic acid and solutions of the muriates give a white precipitate, with salts of the protoxide, composed of the chloride of mercury.

All the salts of mercury are completely decomposed or volatilized by exposure to a dull red heat."—*Reid's Elements of Practical Chemistry.*

5. *Facts relating to Hydrophobia.*—Silliman's Journal of Science for October, just received, like all the previous numbers which we have read, is replete whith valuable and interesting matter. Among other articles which have attracted our attention, is a letter from the Rev. William Case, of Chester, Conn. to the Editor, giving the particulars of four remarkable cases resembling hydrophobia which occurred in that township, and which favor the idea, not only that the canine virus may take effect many years after it has been received into the system, but that, contrary to the opinions usually entertained, it may be communicated from one person to another. We subjoin so much of the letter as relates to these particular cases.

CHESTER, OCT. 14, 1832.

Dear Sir,—In compliance with your request, I have endeavored to collect the facts, respecting the supposed cases of hydrophobia in this place, and the transmission of the poison from one human being to another. I ought, perhaps, to state, that most of the physicians consulted in the three cases of supposed transmission from one human being to another, attributed their death to some other disease, such as might be supposed to be attended by symptoms similar to those which characterize this malady. It is believed, however, that the material facts in these cases, were never fully made known to these gentlemen. Neighbors and attendants, in whose possession they were, feared, perhaps, to disclose them.

In 1807, W. C.* was bitten and wounded by a mad dog, when at the age of eleven years, and on his way home from school. After biting this youth, the dog was confined in a small apartment in his owner's house, where he was seen by many persons, and where he exhibited all the symptoms of hydrophobia. A person, in company with others, with a gun in hand, ascended the chamber stairs, displaced a part of the floor, and through the aperture shot and killed the dog. These facts are attested by a man who was an eye witness, and they are corroborated by many others.

At the time of the bite, in 1807, W. C. is said to have had a feeble constitution, but it is testified on all hands, that he grew up without sickness. It is said, he conducted strangely, by turns, sometime before his last sickness. The disease appeared in him fifteen years after the bite, and was preceded by mental irregularity. He had a short season of strange excitement, during public worship on the Sabbath. At a neighbor's house, the next day, he suddenly jumped, screamed, broke windows, and ran out at the door, with great nimbleness of foot. He soon became quiet and returned, and when his friends remonstrated with him for this conduct, he said he could not avoid doing thus, for he had been bitten by a mad dog. During the progress of the disease, he gnashed his teeth;† discharged large quantities of saliva, had distressing spasms, and was set on biting every body and every thing. The pillow cases through which he made holes, by taking them in his teeth and shaking them, are now to be seen. He spit on persons who came in, and on all parts of the room. He was averse to swallowing any thing. He watched for opportunities to bite persons, and if he could bite any one, it seemed to afford him pleasure, and was followed by laughing. He lived after his attack, fourteen or fifteen days. It required four or five able men to attend upon him. He died Sept 1st. 1822, aged twenty-six years.

L. T. C., S. W. H. and C. C. a brother of W. C. were bitten while attending on him in his last sickness. The bite in these three cases drew fresh blood from the hand or wrist, and this fact is attested by many witnesses. These three cases were preceded by mental anxie-

* The rabid dog which bit W. C., was seen, when he was bitten by another dog supposed to be rabid. I had the facts from a gentleman now residing in Ohio, and as nearly as I can recollect, they are as follow:—A strange dog crossed the orchard adjoining the house, and was seen, without provocation, to seize and bite the dog which bit W. C. The gentleman's daughter, then a small girl, now the widow of C. C., was in the orchard at the time, and her mother, seeing the dog in the act of biting the other, and being alarmed, called her in. The circumstance she well remembers, and says the bitten dog fled into her father's house, instead of his owner's, not more than four rods distant, and ran under the bed. The stray dog afterwards appeared in front of the house and sat down. The gentleman pointed out the spot, described his appearance, and said he had not a doubt of his being mad. If I do not misremember, he was destroyed. The bitten dog bit W. C. between two and three weeks after he received his own bite.

† It is stated also that he howled and growled; but it is easy to suppose that the imagination may convert groans and shrieks of distress into imitative sounds.

ty, and followed by spasms, delirium, and lucid intervals. The first spasms were of short duration, and attended by jumping, hopping, and screaming. Successive spasms continued longer and became more severe. The eyes of all assumed a glassy and watery appearance. What I have termed discharge of saliva, was, in all these cases, called frothing at the mouth.

L. T. C. was a strong athletic man, he was bitten in 1822, by W. C. and after a sickness of two weeks, died March 13, 1826, aged 32 years. Some weeks before his confinement, he exhibited symptoms of mental aberration.* He would hop backward and forwards, and talk incoherently, for a few minutes, and then say, he was sorry he conducted so, but he could not avoid it. His attendants say, the taking of water or drink made him rave. A spectator observes, that he sometimes called for drinks, when it seemed as if he thought they would be refreshing, and do him good; but no sooner had he filled his mouth with the fluid, than he would spirt it in the face of him who offered it, and decline to swallow the drink. So strong was his aversion to swallowing, that a near relative questions whether he could swallow. Another says, that drinks were sometimes forced down; but he shuddered at swallowing. With his mouth he seized by the arm, a person attending upon him, and through thick clothing, left upon his flesh the print of his teeth. He immediately said, "Now I have hurt you, and I am sorry; but I could not avoid it, I must either die myself or bite you." If he had not been confined, says one, I have no doubt he would have bitten every person in the room. A part of the time it required seven able men to keep him to his bed and in his chamber. It is said that he was not known to walk to, or from the bed; but always leaped off and upon the floor; he would whirl suddenly around, and shift his position on the bed, and sit on his feet, and the by-standers imagined that he imitated the motions and the barking of a dog. He frothed at the mouth, and ran out his tongue. He spirted drinks into the face of his attendants, spit on them, on every body and every thing, and all over the room.† His efforts in spasms exhibited such strength as literally to frighten his attendants.

S. W. H. sickened and died August 10, 1807, aged 30 years. He was sick five days, although he had been for years subject to epilepsy, yet there was no appearance of this disease in his last sickness. He was bitten by W. C. in 1822, and carried the scar of the bite to his grave. At the time, there was no general apprehension of hydrophobia, nor any excitement on the subject. It is not known that the fact of his bite

* It is not supposed that there was any proper delirium, but merely that degree of aberration which might be supposed to arise from the violent paroxysms of the disease in a very strong muscular subject. L. T. C. and C. C. particularly, were very powerful men, and C. C. was unrivalled as a wrestler.

† The prevailing popular impressions on this subject are well known; perhaps it is not surprising that some of the distressing and various appearances in hydrophobic patients should be attributed, by the terrified beholders, to a specific canine influence. Medical men do not admit the genuineness of these appearances.

was mentioned to his physician. His disease was pronounced to be something else. Whatever it might have been, it was preceded by mental anxiety, and attended by the following symptoms. He at first inclined to wander from his house, and gave indications of mental aberration, and of a great dread of water. He resided near a small lake, and before being confined to his room, requested his companion to keep him from the water, and be sure and not let him get into that lake; if he did it would kill him. He is represented as having had, in the first stages of his disease, a constant dread of water, but six hours before he died, he called for some, and drank of it. Before his spasms commenced, he entreated his wife, that if he should be as W. C. was, she would procure some strong man to take care of him, and be careful to get some one that would make him mind, lest he should hurt others. During one of his spasms, he bit his tongue, and loosened a piece of it. He requested his wife to take the scissors and cut it out, but to take care and not get any of the blood on her. He would take drinks to oblige his friends and attendants, but they say he always swallowed with a convulsive effort, such as they cannot describe. The disposition to wander continued to the last. He tried various expedients to be released, and to escape from the house. He would grin, and fix his glaring eyes on his attendants, when near him, in such a manner as to make them guard against being bitten. He would take a handkerchief and bed clothes in his teeth, and bite and shake them. He is represented as of a peaceable disposition, and some of his friends think that he made great efforts to curb the disposition to bite.

The death of L. T. C. and S. W. H. left on the minds of the community an impression of mystery. There was a general feeling that the cases were very singular. Individuals, who witnessed their sickness, and were acquainted with the facts above mentioned, firmly believed that they died of hydrophobia, but no professional man had encouraged that belief, or laid stress on the facts which supported it, and the friends, for obvious reasons, were not forward to express it.

Things remained thus, till C. C. a brother of W. C. sickened and died March 24, 1828, aged thirty-seven years. He was sick but eleven days. He was a strong laboring man, and had never before been subject to sickeess. After attending a meeting in the evening, he retired to rest, and slept as usual. About midnight he suddenly sprang from bed, ran undressed into the street, screaming so loudly as to alarm his neighbors. From this first decisive appearance of his disease, remedies seemed not even to abate his distressing symptoms. Nor was his malady suspected by his attending physician, till the third or fourth day. On my making enquiries of a parishioner in regard to the sick man, he said to me, "He is better. Do you know what the people say about C.? they say he was bitten by his brother W. who died of the hydrophobia, and they can prove it, and they know he is mad." I immediately made enquiries, and became satisfied that this was not mere talk. I saw, the next day, his attending physician, and having mentioned the facts to him, I asked if he had suspected the nature of the disease. He replied no. I then enquired if he would not examine his authorities, and look for the symptoms of the

disease, with sole reference to them. His next visit to the sick man resulted in his conviction that his disease was hydrophobia. The physician had told the attendants, that if they would preserve some of the saliva, and inoculate a dog with it, he would become rabid in a certain number of days. They had carefully taken up on a woollen string and dropped into a phial a quantity of this and corked the phial. They had selected the victim and the place of his confinement, and were holding the corked phial in the hand, when the man was seized with his last spasm. The phial was suddenly dropped, and all search for it in future proved ineffectual—a circumstance deeply to be regretted, for had the experiment been made, the result would probably have removed from every mind, capable of appreciating it, all doubt respecting the sick man's disease. The following are some of the facts as stated to me by his physician, and corroborated by his widow and those who attended him. The sight of water produced a recurrence of distressing spasms, or in the language of attendants made him rave. In the intervals of spasms he was rational. In one he requested his father-in-law to remove and hide his razors, for he did not know what he might be led to do in his turns. In another, he gave this caution to his wife. "I wish you to keep away from me when I have these turns; I know not why it is, but I want to bite, and fear I shall bite you." His attendants think he strove to curb the disposition to bite. It was however very evident. A neighbor one evening entered the room. On seeing him, he immediately said in a pleasant way, "How do you do, Mr. B——? I am glad to see you. Come here, I want to shake hands with you." The neighbor approached and extended his hand. The sick man seized it instantly, and with a convulsive spring, rose from the lying posture and drew it to his mouth. The attendants who stood near, and expected this result of shaking hands, instantly seized Mr. B——, and forced him from the sick man's grasp before he was bitten. He talked much about biting, and the attendants, as usual in such cases, imagined that he growled, snapped and barked like a dog. The shaking of pillows and bed clothes in his teeth was a frequent exercise. His eyes were glassy and watery. He spit much the night after he left the bed, and during his sickness. He spit on all parts of the room, and watched the opportunity to spit on persons who came into it. During his sickness, and especially the night before his death, he screamed and hallooed dreadfully.

On the supposition that these are to be regarded as cases of real hydrophobia, the facts will stand thus.

1. W. C., first victim, bitten by a rabid dog, in 1807. Sick fifteen days. Died fifteen years after the bite, in 1822, aged 26 years.

2. L. T. C., second victim, bitten by W. C. in 1822. Sick fourteen days. Died short of four years after the bite, in 1826, aged 32 years.

3. S. W. H., third victim, bitten by W. C in 1822. Sick five days. Died five years after the bite in 1827, aged 30 years.

4. C. C., fourth victim, bitten by W. C. in 1822. Sick eleven days. Died short of six years after the bite, in 1828, aged 37 years.

These facts are well established, and they preclude the necessity, if not the propriety of referring the symptoms of their disease to what is sometimes termed spontaneous hydrophobia. Nor did the previous habits of life in a majority of the patients, at all favor such a reference of their symptoms.

C. C. was a constant spectator of his brother W. C. in his last sickness. They died in the same house. C. C. also watched with L. T. C. and S. W. H., and repeatedly told his wife, as she now affirms, that they were sick just as his brother was. A sensible man who witnessed three of the cases says the persons were sick alike as nearly as the difference of natural dispositions and habits of life would permit. Different individuals, who observed attentively two or three of the cases, bear the same testimony in such numbers, as to include in it all the four. With persons at all acquainted with the facts and cases, it is now the general opinion that the disease was hydrophobia.

All four dreaded confinement, and exhibited great quickness of apprehension in regard to persons, and circumstances which surrounded them. There was uncommon agility and sprightliness in their motions, and an evident display of cunning, especially in their efforts to escape and bite persons. Till within about two days of the termination of the disease, the patients were not only inclined to escape, but a primary object of the intended escape, was to have opportunity to run. It is the opinion of the attendants, that if they could have escaped, they would have run till they dropped down dead. One among other things, pretended to have business at a place sixteen miles distant. He plead with his attendants to let him place his feet on the door steps, and assured them that if he might do it, he would run so that no man could overtake him till he had reached the place.

The fears of all were that they would injure others. One was, at times, afraid of receiving injury from others; but this fact, it is believed, may be explained, by a reference to circumstances peculiar to himself. All that is claimed, however, is that there was a general concurrence in the class of symptoms to which allusion has been made. From momentary agitations, connected with slight mental aberration, the spasms gradually increased, in duration and force to the last. One attendant says the strength of the patient seemed to increase during the spasms, and he finally sunk under them. This man's services have always been sought, and freely rendered in extreme sickness. He affirms that he never witnessed cases resembling these. In attending on the last individual, he covered with rags spots of fractured skin on his hands, least the saliva of the patient should reach them. Another procured and constantly wore, a pair of stout gloves. An attendant in one of the cases, says, that twelve hours' services at a time, was as much as he could endure, and that others were obliged frequently to change, and retire from the scene, and suspend the efforts required of them when present.

Many testify that there was in all the cases, during the spasms or spells, as termed, an uncommon scent from the patient's breath. This was observed in every case by numbers. Some designate it by the epithet strong; others say they never experienced the like before, nor

since, and they cannot describe it. All seem to remember it as perfectly distinct in this character. One person, in endeavoring to convey an idea of it, said it resembled that of cats and dogs when fighting. This smell was not perceived, except at the times when the patient raved, or had spells and frothed at the mouth.

It is the opinion of attendants, that the patients were literally stiffened during the spasms, and that in the latter stages of the disease, they might have been raised up erect by the application of force to the head, without any bending of the body. The corpses were stiff immediately after dissolution, and the jaws set so as to require no muffler. On them, and near the surface of the skin, blue spots appeared, which some mistook for indications of mortification. One was kept four days, and on this body the spots wholly disappeared, and it underwent no other visible change. It is stated that the spots appeared as soon as the patient was supposed to be struck with death, and that when they disappeared, they left the skin slightly affected, and of a greenish hue. It is said the corpses had a strange appearance, the countenance resembling that of a living person in health when cold. Some designate this appearance by the epithet blue.

P. S. An intelligent medical man, who has heard the above statement, and conversed largely with witnesses, believes these cases to have been hydrophobia. Two of them have been attributed by others to delirium tremens, but the previous habits of the patients did not favor that idea; none of the four were addicted to the use of ardent spirits, and one of them had a constitutional aversion to distilled liquors.

The above cases possess so many points of resemblance to hydrophobia, that it may appear unreasonable to deny them to have been of that character; but at the same time, it cannot be denied, that there are many circumstances which leave it very questionable. 1. In the first case, the great length of time which intervened between the bite and the attack of the disease, is, in itself a suspicious circumstance. Numerous cases of supposed hydrophobia are indeed recorded, in which a similar interval has occurred, and if the poison may lie dormant in the system for one year, unaffected by the action of the absorbents, it is not easy to conceive why it may not for an indefinite length of time. The hydrophobic character of these diseases, however, has been generally doubted by the best medical writers, and these cases have seldom been attended with such evidences of authenticity as to place it beyond doubt; until the fact therefore be completely established that the virus may lie dormant in the

system for years, and eventually produce the disease, humanity requires that the belief should not be countenanced.

2. The symptoms do not very accurately correspond with those which are usually described as characteristic of this disease. Popular belief, it is true, ascribes to such patients all the symptoms which attend rabies in animals; but in those cases that have been recorded by medical men, neither the disposition to bite, nor the mental alienation have been at all prominent symptoms. That such patients might accidentally bite their attendants in the agony of the convulsive paroxysms to which they are liable, may be easily imagined; but they are generally inoffensive and preserve the full possession of their intellectual faculties until the last moment of their lives. Excessive nervous agitation is the prominent symptom of the disease.

3. Two of these patients appear to have been constitutionally liable to nervous affections—one of them having been affected with derangement some weeks before his confinement, and the other having been for years subject to epilepsy.

4. The duration of the disease is not very consistent with the speedy termination of hydrophobia—two of them being sick two weeks, and the other eleven days before death.

5. The aversion to water does not appear to have been as prominent a symptom as it generally is in hydrophobia. There is no mention of it in relation to the first individual—the second and third took liquor into their mouths, and one of them called for water and drank it a few hours before his death.

6. There is evidently inaccuracy in the details of these cases, arising from defect of memory and the influence of the imagination in those from whom the facts were collected. Implicit confidence can seldom be reposed in the reports of disease, even when drawn up, at the time, by persons whose education and habits of observation might be supposed peculiarly to qualify them for the task, still less when drawn up at the distance of years, by persons who are unaccustomed to discriminate the symptoms of diseases. F.

6. *Aneurism from Wound of the Brachial Artery in Venesection.*—"Four forms of aneurism may arise in the bend of the arm from a wound of the brachial artery (sometimes the radial) in venesection, aneurismal varix, varicose aneurism, diffused and circumscribed false aneurism. Respecting the treatment of the last two, considerable difference of opinion exists among practical surgeons, some contend that both require an operation, while others maintain their curability by compression.

The advocates for the operation have not as yet decided upon the precise situation where the vessel should be secured, nor upon the mode of securing it, some apply a ligature upon the vessel above the aneurism, and depend upon the absorbents for the removal of the tumor, whilst others open the aneurism, and tie the artery above and below the wound.

The supporters of the mode by compression have not yet agreed either upon the place where the compressing force should be applied, nor upon its degree; some direct violent pressure to be made upon the vessel above the aneurism to obliterate its canal, whilst others are content to apply very slight pressure to the tumor itself.

In the midst of such conflicting opinions, we must appeal to facts, before we can arrive at any thing like a satisfactory conclusion.

Case 1.—*Circumscribed Traumatic Aneurism—Cure by Compression.*—John Miley, æt. 27, applied at Stevens' Hospital on the 11th of October, 1828, with circumscribed aneurism of the brachial artery in the bend of the arm. The tumor was firmly pulsatory, about the size and shape of a pigeon's egg, apparently intimately connected with the artery. It was diminished by pressure, and regained its size on its removal. The radial pulse was weaker on that side than on the other. The integuments presented a small cicatrix. The patient had been bled by a *blacksmith* thirteen days previously. The patient observed "the beating tumor" on the removal of the bandage several days afterwards. The case appeared a fair one for the employment of compression.

The patient was immediately confined to bed, the limb placed upon a pillow, some cathartic mixture prescribed, and sixteen ounces of blood extracted from the opposite arm.

The next day, a thin compress of wetted lint was laid upon the aneurism, and a roller bandage applied from the fingers to the bend of the arm, in the manner recommended by Genga, care being taken that the compression should not extend above the aneurism, the turns of the bandage over the aneurism were very loosely applied. The patient was desired to keep the compress constantly moistened with cold water, and to take a draught containing two drops of tincture of digitalis every sixth hour. Two days subsequently the bandage was opened and re-applied, the draught was continned, and he had sixteen ounces of blood taken from the opposite limb.

On the 7th day, the aneurism felt more solid, and did not diminish so sensibly when compressed. The bandage was re-applied, and a

compress of sponge substituted for the lint. The digitalis continued, and other treatment as before.

On the 17th day, the aneurism appeared sensibly diminished, and much more solid; the pulsation in it was less distinct, whilst that at the wrist appeared more full. Bandage continued; the turns which passed over the compress being applied more firmly than before. Pulse 66. Patient is in perfect health, but complains much of the strict antiphlogistic regimen which he is compelled to observe. He was ordered to take a draught containing thirty drops of tincture of digitalis every second hour. In the evening his pulse was down to 38. He did not complain of nausea or giddiness. The draughts were continued. On the 14th day, the digitalis was administered in doses of twenty drops every sixth hour.

On the 20th day, the tumor was much larger than a marble, perfectly hard, and without pulsation. The radial pulse beat firmly, and nearly as full as on the opposite limb. The bandage was re-applied, the compressing force being increased. Digitalis omitted. Antiphlogistic treatment still persevered in.

On the 30th day, there was no trace of the aneurism; the brachial artery could be felt pulsating strongly beneath the cicatrix in the integument, and the radial pulse appeared as full as that of the opposite limb.

On examining the patient eighteen months subsequent to his dismissal from the Hospital, no trace of the aneurism could be detected, the artery pulsated beneath the cicatrix strongly; the pulse at the wrist felt perfectly natural, and he stated that he had not suffered the slightest inconvenience from the arm in pursuing his very laborious occupation."

Case 2.—*Circumscribed Aneurism—Compression—Cure.*—Terence M'Evoy, æt 25, was admitted into Dr. Stevens' Hospital, March 2d, 1829, with circumscribed aneurism at the bend of the arm. The tumor was distinctly circumscribed, fully as large as a turkey's egg, pulsating, uniformly elastic, except at the anterior part, where it felt soft and pulsated most strongly. Pressure on the brachial artery stopped its pulsation but did not diminish its size. An artery of considerable magnitude ran over its anterior surface, but did not seem to be connected with it. The integuments were healthy; an old cicatrix was observable on the centre of the swelling. Nine months previously he had been bled, and, on removing the bandage three days afterwards, he noticed a small pulsating tumor. The treatment so nearly resembles that adopted in the preceding case, that we need not stop to particularize its items. On the 50th day there was no trace of the aneurism. The artery which had been wounded could be felt pulsating strongly beneath the cicatrix at the bend of the arm, and the vessel which ran across the tumor (the radial) appeared perfectly natural.

Case 3.—*Circumscribed Aneurism—Compression—Aneurism rendered diffused—Operation—Cure.*—John Byrne, æt. 35, admitted

February 25th, 1830, with circumscribed aneurism of the brachial artery, produced by wound of the vessel in venesection five weeks previously. The tumor was oval, as large as an orange, adhering to the brachial artery, solid at the base, soft and elastic in the centre. On compression of the brachial artery the tumor lost its pulsation and became softer.

The same treatment was adopted as in the former cases, and, on the eighth day the tumor appeared more solid. The pressure was re-applied with more firmness. He passed a restless night, and on the following morning complained of great pain in the tumor and arm. The aneurism was found to be no longer circumscribed, but to extend along the inner edge of the biceps muscle towards the axilla, for several inches. The whole swelling, particularly the upper part, was soft and fluctuating; the pulsation throughout not very distinct; in short, it was now a case of diffused aneurism. In consultation, it was determined to treat it as a wounded artery. The tumor was fairly opened into, the coagula turned out, the artery tied above and below the wound in it. The ligatures were thrown off on the twelfth day, and on the 30th he left the hospital quite well.

It is manifest from the foregoing cases, that the form of aneurism to which pressure is most applicable, and in which it is most likely to effect a cure, is that of circumscribed false aneurism, unattended by inflammation either of the sac and surrounding parts.

It is equally obvious, that the pressure should be applied to the tumor alone, and not to the artery above, and that the degree of pressure be slight until the diminished pulsation and solidity of the tumor indicate that coagula fill the sac, otherwise the aneurism will become diffused, as took place in the third case. It is probable, if not certain, that the opinion hitherto entertained respecting the obliteration of the artery of the part wounded, is, in the majority of cases, erroneous and without foundation. The pulsation beneath the cicatrix remained strong and natural, after the absorption of the tumor in both cases, and in a case of circumscribed false aneurism in the bend of the arm from bleeding, which Mr. Wilmot cured by pressure, several years ago, in Jervis-street Hospital, the artery continues to pulsate strongly beneath the cicatrix to this day.

The utility of combining Valsalva's mode of treating internal aneurisms with gentle pressure on the tumor itself, was well exemplified in these cases."

7. *Chronic Hydrocephalus cured by Puncturing.*—A child, aged four months, presented a well-marked case of this disease; the largest circumference of the cranium was 18 1-4 inches; the fluctuation was very perceptible at the fontanelles; for when pressure was made upon one, the other was distended and forced out. M. Graefe, compressing the larger fontanelle, plunged a large cataract needle into the smaller one to the depth of the third of an inch. A little viscid fluid escaped, drop by drop; he, therefore, introduced a very fine trocar, and immediately a transparent yellow-brown liquid flowed out freely—

uniform pressure was made on the head as the water escaped. When an ounce and a half had been evacuated, the infant began to faint, and became extremely languid. The canula was, therefore, removed, and a firm bandage put round the head. Stimulants were given, but the child was restless and ill for two days. A similar train of symptoms followed each operation, which was repeated generally at an interval of 12 or 14 days, and sometimes between two and three ounces were discharged at a time; the size of the head sensibly diminished, and the general health improved. The puncturing was repeated eleven times in the year 1829, on the following days—8th, 15th, and 23d of January, 19th of February, 5th and 19th of March, 19th and 27th of April, 5th and 17th of May, 23d of June. The evacuated fluid was thicker and more coagulable towards the end of the cure. The smaller fontanelle and the sutures in the course of time closed; the child became healthy and strong. When ten months old it began to walk; and on the 26th of November, 1830, the child aged two and a half years, was presented well and active to the Society of Medicine at Berlin.—*Graefe and Walther's Journ. der Chir.*

8. *Preternatural Lactation.*—Aristotle gave immortality to the he-goat of Lemnos, when he affirmed, for the benefit of after-ages, that the generous animal yielded a profusion of milk, from which the goat-herd made excellent cheese. Very useful too, in this way, was "the wether which suckled a lamb;" and the history of this phenomenon is a contribution to philosophy, from the pen of Dr. Doddridge, alike distinguished for his sagacity and erudition, and piety.

Donati, in his "Marvellous History;" Paulini in his second "Century;" and the Bishop of Cork, related instances of the lacteous secretion being abundant in men.

Cardani enumerates the circumstance of a young woman, who had never been impregnated, whose breasts yielded milk, on their being excited with the stings of nettles. Dr. Stach, and Dr. Montegre have detailed cases of copious lactation accidentally re-produced in *aged* women: to these the present writer will add some account of a woman who gave suck to children, from the *twenty-fifth* uninterruptedly to the *seventy-second* year of her age: this person is still alive and accessible to examination.

1. *Dr. Stack's History.* Elizabeth Brain was examined by Dr. S. and another gentleman, at her house in Tottenham-court, in 1733: she was then in the 68th year of her age; and for more than twenty years she had not given birth to a child. Her breasts were "full, fair, and void of wrinkles; but her face and mouth was very much withered, her cheeks and mouth vastly sunk in, her eyes red and running with a clammy humor." Upon pressing her right breast at the Doctor's desire, "she fairly squeezed out milk which gathered in small drops at three of the lactaferous ducts terminating at the nipple." Having himself carefully dried the nipple with his handkerchief, Dr. S. made her repeat the experiment, and it had the same result.

About four years previous to this examination, E. B's daughter being obliged to be absent for a considerable time, left a babe she was then suckling, in the care of its grand-mother: the old woman, finding the child froward for want of the breast, applied it to her own, barely in order to quiet the infant, without the least thoughts of milk." This having been repeated several times, a son of E. B's, now grown a man, perceiving that the young one swallowed something from the nipple, "begged leave of his mother to try if he could not milk: his experiment succeeded, and he drew milk out of the same breast from which he had been weaned above twenty years; for seventeen or eighteen years previously his mother had not given suck to any child. Two years afterwards, E. B's daughter had another babe; whereupon its grandmother weaned the first, and commenced suckling the new-born infant. "In my presence, says the Doctor, this infant took the nipple with as much eagerness and seeming delight, as I ever perceived in a child of two years old; and at it plainly performed the actions of suction and deglutition: the two children, both girls, are, as to constitution, such as I could wish to the dearest friend; plump, and firm in flesh; in complexion cleanly, fair and healthy; and in temper brisk and sprightly, considering the mean diet of their nurse.

When this good woman came to town," the Doctor adds, "which was near two years since, her milk abounded to that degree in both breasts, that, to convince the unbelieving, she would frequently spout it above a yard from her: a particular which, among others, the good man and woman of the house, and others of the neighborhood, likewise, assured me of. Now her left breast is run dry, and she has no great quantity in her right; but what there is, is as good milk as one may desire in a nurse. The poor woman seems perfectly honest and artless, and even inclines strongly to dotage: she very religiously throws the whole upon a miracle."

Dr. Montegre's History. Having collected a number of analagous facts, Dr. M. published them in the 'Gazette de Sante,' in connexion with the following, which came under his own observation. "La Femme Charles," a delicate female, had male twins in 1810, but from the great weakness of her constitution, she could hardly supply one of them with milk; and in consequence of extreme poverty was unable to procure the services of a nurse. Affected by this discouraging embarrassment, says Dr. M., her mother, took one of the infants and put it to her own breast, which the babe instantly seized and began to suck. This ingenious grandmother was then in the sixty-fifth year of her age, and had been twenty-nine years a widow. At first her breasts yielded a fluid, in small quantity; but in a few days, her infantile grand-child drew from them an abundance of healthy milk. This tender nursling continued for two and twenty months to be nourished at its grand-mother's breasts; and throughout all that period was more vigorous than its brother who imbibed his sustenance from their common parent.

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Dr. K's History. Judith Waterford lives in the village of Thringston, on the Forest, between Ashby-de-la-Zouch and Loughborough, Leicestershire. At this time, (*December*, 1831), she is in her eighty-first year, and though infirm, her constitution has singularly retarded the advances of old age. Through life, this woman has been the active and laborious inmate of a peasant's cottage; her person is short and well proportioned: at one time she weighed about 14 stone: her temperament is the neuro-sanguineous, distinctly marked. The peculiar circumstances of her history being extensively known in the district where she resides, she has been visited by many clerical, medical, and other curious inquirers.

J. W. had two husbands. Previously to her first marriage, her menstrual secretion appeared at regular periods; it continued nine days usually, and was very profuse, but preceded and accompanied with little pain or disturbance of the system. After this event, it returned only nine times, at distant and irregular intervals; and on each of these occasions it was abundant, without causing any perceptible diminution of her milk.

J. W. was first married in 1777; her first child was born in May, 1778; and from that period till May, 1825, her lacteous secretion never in the least subsided. Besides giving her breast freely and frequently to the young ones of her neighbors, she suckled six children of her own by her first husband, and eight nurslings: She had two miscarriages. Her first confinement was followed by an excessive uterine discharge, which continued three weeks and induced considerable debility. No infant however vigorous, was ever nearly able to use her supply of milk; and, in consequence, she often had her "breasts drawn" to the amount of two quarts in a day: her belief is, that, in general, she could have suckled four lively children at the same time. Many attempts were made, even under medical direction to suspend the secretion of her milk; but they all utterly failed. Her breasts often became tense and painful; and, for the removal of this state, she had them well rubbed with butter made from the cream of her own milk; this process was invariably advantageous. Sometimes about a pint of this cream was collected, and the butter it yielded was white, and soft as lard, with a sweet taste. Judy took much food, and seldom had recourse to medicine; it is her boast, indeed, that "she never paid a shilling in her life for doctoring for the sake of her health;" her bowels generally were torpid, often constipated.

J. W. was a widow nearly three years, and gave suck to her own and other children during the whole of that period. She had one still-born child to her second husband. Her breasts even now, retain a size quite extraordinary, and the axillary glands are occasionally large. Soon after the disappearance of her milk, in 1825, her health became more variable, her energies gradually failed, and her voice, which still is strong, lost its natural strength. Her actual powers of mind seem to have experienced little change; she continues "heart-whole;" her appetite is considerably impaired; she wishes to eat often, but takes little food at a time; her sleep is disturbed and une-

freshing, and a cough gives her occasional annoyance: her pulse is full, soft, not quick and resistant. For many months she has been slightly troubled with those periodical disturbances by which menstruation is preceded.

Although Judy's milk ceased, for a time, in 1825, it repeatedly appeared in minute quantities during the five subsequent years; but since the autumn of 1830, the secretion of this fluid has been constant, and, if encouraged, (she thinks), would be sufficient to nourish a child; from attempting this, however, she is deterred by the idea, that "it would soon be the end of her."

December 6, 1831. This day, being in the middle of her 81st year, Judy readily filled a small spoon with her milk, by squeezing her left breast frequently with the hand. This milk was rich and sweet, and not different from that yielded by young and healthy mothers.

Here, then are the remarkable circumstances of a woman who menstruated during lactation—who suckled children uninterruptedly through the full course of forty-seven years—and who, in her eighty-first year, has a regular secretion of milk.—*Medico-Chirurg. Rev.*

9. *Efforts of Nature to establish a new Joint after dislocation. Hip Joint. Dislocation into the Foramen Ovale.—Dissection.*—There is an excellent preparation of this accident in the collection at St Thomas' Hospital, which I dissected many years ago. The head of the thigh-bone was found resting on the foramen ovale, but the obturator externus muscle was completely absorbed, as well as the ligament naturally occupying the foramen, now entirely filled with bone. Around the foramen ovale bony matter was deposited so as to form a deep cup, in which the head of the thigh-bone was inclosed, but in such a manner as to allow of considerable motion; the cup thus formed, surrounded the neck of the thigh-bone without touching it, and so inclosed its head, that it could not be removed from its new socket without breaking its edges. The inner side of this new cup was extremely smooth, not having the least ossific projection at any part to impede the motion of the head of the bone, which was only restrained by the muscles from extensive movement. The original acetabulum was half filled by bone, so that it could not have received the ball of the thigh-bone if an attempt had been made to return it to its natural situation. The head of the thigh-bone was very little altered; its articular cartilage still remained; the ligamentum teres was entirely broken, and the capsular ligament was partially torn through; the pectinalis muscle and adductor brevis had been lacerated, but were united by tendon; the psoas muscle and iliacus internus, the glutei and pyriformis, were all upon the stretch. Nothing can be more curious, or, to the surgeon and physiologist, more beautiful, than the changes produced by this neglected accident, which exemplify the resources of nature in producing restoration.

Dislocation backward, into the Ischiatic Notch.—Dissection.—There is a good specimen of this accident in the collection at St. Tho-

mas's Hospital, which I met with accidentally, in a subject brought for dissection. The original acetabulum is entirely filled with a ligamentous substance, so that the head of the bone could not have been returned into it. The capsular ligament is torn from its connexion with the acetabulum, at its anterior and posterior junction, but not at its superior and inferior. The ligamentum teres is broken, and an inch of it still adheres to the head of the bone. The head of the bone rests behind the acetabulum on the pyriformis muscle, at the edge of the notch, above the sacro-sciatic ligaments. The muscle on which it rests is diminished, but there has been no attempt made to form a new bony socket for the head of the os femoris. Around the head of the thigh-bone a new capsular ligament is formed; it does not adhere to the articulatory cartilage of the ball of the bone which it surrounds, but could, when opened, be turned back to the neck of the thigh-bone, so as to leave its head completely exposed. Within this new capsular ligament, which is formed of the surrounding cellular membrane, the broken ligamentum teres is found. The trochanter major is placed rather behind the acetabulum, but inclined towards it relatively to the head of the bone.

In this specimen, from the appearance of the parts, the dislocation must have existed many years; the adhesions were too strong to have admitted of any reduction, and if reduced, the bone could not have remained in its original socket.

Dislocation on the Pubes.—Dissection.—I dissected one of these dislocations, and we have it preserved in our anatomical collection. It shows changes of parts nearly equal to those of the dislocation into the foramen ovale. The original acetabulum is partly filled by bone, and partly occupied by the trochanter major, and both are much altered in their form. The capsular ligament is extensively lacerated, and the ligamentum teres is broken. The head of the thigh-bone had torn up Poupart's ligament, so as to penetrate between it and the pubes. The head and neck of the bone were thrown into a position under the iliacus internus and psoas muscles; the tendons of which, in passing to their insertions over the neck of the bone, were elevated by it, and put on the stretch. The crural nerve passed on the fore part of the neck of the bone upon the iliacus internus and psoas muscles. The head and neck of the thigh-bone were flattened, and much changed in their form. Upon the pubes a new acetabulum is formed for the neck of the thigh-bone, the head of the bone being above the level of the pubes. The new acetabulum extends upon each side of the neck of the bone, so as to lock it laterally upon the pubes. Poupart's ligament confines it on the fore part; on the inner side of the neck of the bone passed the artery and vein, so that the head of the bone was seated between the crural sheath and the anterior and inferior spinous process of the ilium.

Shoulder Joint; dislocation in the Axilla.—Dissection of an old Dislocation.—The head of the bone is found altered in its form; the surface towards the scapula being flattened, a complete capsular ligament

covers the head of the os humeri. The glenoid cavity is completely filled by ligamentous matter, infused by a slow inflammatory process; in this ligamentous matter are suspended small portions of bone, which appear to be of new formation, as no portion of the scapula or humerus is broken; a new cavity is formed for the head of the os humeri on the inferior costa of the scapula, but this is glenoid, like that from which the os humeri had escaped.

Dislocation forwards.—Os Humeri; appearances on dissection.—The head of the os humeri is, in this accident, thrown on the inner side of the neck of the scapula, between it and the second and third ribs. I have had no opportunity of dissecting a recent accident of this kind; but in the Museum at St. Thomas's Hospital there is a beautiful specimen of one in a limb which had been long dislocated, and which was removed from the shoulder of a patient by Mr. Green, and dissected by Mr. Key, who gave me the following account of the appearances:—The head of the bone was thrown on the neck and part of the venter of the scapula, near the edge of the glenoid cavity, and immediately under the notch of the superior costa; nothing intervened between the head of the humerus and scapula, the subscapularis being partly raised from its attachment to the venter. The head was situated on the inner side of the coracoid process, and immediately under the edge of the clavicle, without having the slightest connexion with the ribs; indeed, this must have been prevented, by the situation of the subscapularis and serratus magnus muscles between the thorax and humerus. The tendons of all the muscles attached to the tubercles of the humerus were perfect, and are shown in the preparation. The tendon of the biceps was not torn; and it adhered to the capsular ligament. The glenoid cavity was completely filled up by ligamentous structure; still, however, preserving its general form and character. The tendons of the supra and infra spinatus, and teres minor muscles, adhered by means of bands to the ligamentous occupying the glenoid cavity: and to prevent the effects of friction between the tendons and the glenoid cavity in the motions of the arm, a sesamoid bone had been formed in the substance of the tendons. The newly formed socket reached from the edge of the glenoid cavity to about one third across the venter. A complete lip was formed around the new cavity, and the surface was irregularly covered with cartilage. The head had undergone considerable change of form, the cartilage being in many places absorbed. A complete new capsular ligament had been formed.

The pectoralis minor is not mentioned in this dissection; but from the natural situation of the coracoid process, into which this muscle is inserted, it must have passed over the head of the os humeri, as did the pectoralis major.—*Cooper on Dislocations.*

10. The following quotation, from Godman's Anatomical Investigations, will go far towards illustrating the principle of the

formation of a new capsular ligament around joints in unreduced dislocations.

On the formation of the Capsular Ligaments of the Joints.—Anatomists hitherto have uniformly considered the *capsular* and *proper ligaments* of the joints as similar in character, and, like the latter, being merely continued from a point of origin on the extremity of one bone to an insertion near the extremity of another. By the *proper* ligaments I mean those that are solid, fibrous, and mostly perpendicular, resembling the lateral ligaments of the knee joint and those from the fibula and tibia to the tarsal bones.

The capsular ligaments, however, must be separated from the proper ligaments, inasmuch as they are immediately related to the muscular system, being formed by the layers of the fasciæ which sheathe all the muscles, or fairly encircle them.

The muscles of the upper part of the body and all the trunk, not excepting the heart, are contained within duplicatures of the fascia superficialis. The same fascia forms the *capsular* ligament of the shoulder joint, by the succession of the layers forming the sheaths for all the muscles about the scapula going to be laid out over the joint, and by their aggregation constituting the thickness of this capsule.

The fascia lata femoris sheathes all the muscles of the inferior extremities, and the duplicatures, enclosing the muscles of the thigh, form the great capsule of the hip joint, as minutely described in my Anatomical Investigations recently published. On the same principle the capsular ligaments throughout the body appear to be formed from the fasciæ sheathing the muscles. For the details I must refer to the work above named, and the 18th No. of the Philapelphia Medical and Physical Journal, in which the details of the formation of the capsular ligament of the shoulder joint will be given.

The muscles within the belly and pelvis derive their sheaths from the *fascia interna abdominis*, heretofore called *fascia transversalis*, which also forms the ligaments of the liver and bladder, the prostrate fascia, &c.

Some persons in speaking of the *fascia superficialis* state that it is composed of condensed cellular membrane. This is correct as applied to its ultimate analysis, but not when we examine it in the recent subject. It is equally true that the skin, tendon and bone, are composed of cellular texture, but we only arrive at this conclusion by a long and careful series of experiments.

The discovery of the formation of the capsular ligaments by a thorough *analsyis* of the fasciæ, leads to a variety of important conclusions relative to their physiology and pathology, and gives us a better idea of their relation to the strength of the muscles, whose actions are all modified by the manner in which they are sheathed by these fasciæ. See 18th No. of Philadelphia Medical Journal.

11. *Singular case of Lacerated Wound.*—By James Deane, M. D., of Greenfield, Massachusetts.—Mr. J., about twelve weeks since,

while standing near the end of the arbor of a heavy grindstone revolving rapidly by water power, had his clothes caught by it and twisted up like a thread upon the spindle. This twisting commenced near the genital organs, and immediately involved them in the operation, in such a manner as to remove every portion of integument and cellular membrane from the penis and upon the pubis, in a circular line from one external ring to the other. Every particle of the scrotum was torn away, leaving the cremaster muscles and tunicæ vaginales completely naked. The right spermatic cord was affected with involuntary twitchings; but the left appeared considerably elongated, and to have sustained considerable injury. Both cords were entirely detached from all connections up to the external rings from which they hung, and a better display of the parts, or clearer dissection, could not have been made by the most expert anatomist. The sensibility of the denuded parts was most intolerable; the gentlest touch produced exquisite suffering. The circumference of the injury was well defined resembling more an incised than lacerated wound; it was regular in its outline, extending from two inches above the penis to the perineum, and in depth to the external fascia. A penknife with three blades, which went into the operation, was bent into a circle and the blades broken, showing the great power which well nigh spun his thread of existence to an end. Had not the machine been soon stopped, the penis and both testicles must inevitably have been torn away; as it was, it was a frightful injury, and in its nature, perhaps, without a parallel.

In this state of things the medical gentlemen of the vicinity were immediately assembled, and from the singularity of the case some embarrassment was experienced in deciding upon the best course to adopt. It was, however, decided that as the left spermatic cord had sustained severe injury, and as its loss would not necessarily cause emasculation, it should be removed. In this trying situation the fortitude of the patient did not forsake him; he entreated that this measure should be adopted, if his safety in any way depended upon it. The operation was easily performed by holding the cord firmly between the thumb and finger and dividing it with a bistoury, and tying a single artery which bled very freely. Upon relaxing the pressure, the spermatic vessels were felt to recede through the fingers; and, as a precautionary measure, a ligature was loosely applied to the remnant of cord to prevent its recession into the abdomen, which, however, did not take place. The wound was then dressed by wrapping the parts in the lightest linen wrung from a liniment composed of equal parts of lime water and of olive oil. This dressing was found exceedingly useful in protecting the denuded surface from irritation, without evaporating. The penis and remaining testicle were suspended in bandages passing over the legs.

Nothing could exceed the sensibility of this wound. The slightest motion, or touch, or drop of urine, would excite intolerable suffering. The treatment was completed by observing the strictest antiphlogistic rules. The cure went on well enough, but was a serious business for the patient. The moment he went to sleep, he was troubled with

erection, which caused excruciating pain. This was not all; an induration of the inferior surface of the penis added chordee to this symptom, and these continued for more than two months. Doubtless this erection was a desirable circumstance for obvious reasons; still it was most tormenting, causing bleedings and short and disturbed sleep.

Although the progress of the cure was slow, yet it was wonderful to witness the resources and operations of nature. The testicle, which swung from the external ring, united to the surface of the wound in the perineum; the cavity of this wound was filled by granulations, and covered in part by the contraction of the skin from its edges, and partly skin newly organised, as was the penis (but without prepuce) and anterior surface of the testicle. The testicle is well provided for, being buried and protected in the perineum: the integument now covering the penis is loose and ample, which is to be attributed to the erection, for two months such a source of torment.

Mr. J. is a young man in robust health, and submitted with great resolution to all the painful emergencies in which this unfortunate accident placed him; and I have no doubt but he will ultimately be restored to his full procreative powers. This case, too, gives a useful lesson upon the restorative powers of nature; and it appears to me that we do not place reliance enough upon this wonderful provision, and that we too often lay down science to take up the knife.—*Boston Med. and Surg. Jour.*

12. *On the Sleep of Plants.*.—M. Virey, in a memoir entitled *Flore Nocturne*, (Flora Nocturna,) announces the following results or laws, which he has deduced from his researches on this subject. Cold and humidity diminish the transpiration of vegetables; the sap, then, instead of ascending to the summits of the leaves and flowers, as during the day, descends towards the roots. Hence, the sap vessels of those parts, frail and fine as they are in many plants, become almost empty and contract by their own elastic force. This is the reason why so many compound flowers, the Malvaceæ, the Convolvuli, &c. close during the night, or even when the sky is covered with clouds. For a similar reason, a numerous class of plants with pinnated leaves, fold them and sleep during the night. The returning warmth of the sun again sets the sap in motion, and again invigorates the leaves and petals. The heat and light dilate the vessels with a sort of turgescence, and expand the foliage until the return of night again drives the sap from their delicate vessels. But why is it otherwise with nocturnal plants, which appear to languish and to be overcome during the day, and unfold their beauties only when the sun is withdrawn? It is because his ardor acts too powerfully upon the frail texture of certain petals—evaporates too rapidly their nutricious juices, and causes them to close. But during the freshness of the night, these juices remain in the tissue of the plant, fill their tubes, and unfold their surfaces to the atmosphere. *Rev. Encyc.*

13. *Ilicine—a Remedy in Intermittent Fever.*—Doctor Emile Rousseau has just published his own observations, together with those of

eminent practitioners in civil and marine hospitals, as well as those of various private physicians no less estimable, all uniting in ascribing to the leaves of the common Holly (Ilex aquifolium) great efficacy in the treatment of intermittents. They consider this indigenous plant as the powerful succedaneum of quinquina and the sulphate of quinine. Several of them agree in considering the holly as superior to quinquina. Dr. Rousseau deserves great credit in bringing the virtues of this plant so fully into notice. He has succeeded in obtaining its active principle in an isolated form, and has given it the name of *Ilicine.—Rev. Encyc.*

14. *Regeneration of Nerves.—Remarks on the Regeneration of Nerves.* By F. Tiedemann.—Divided nerves unite and heal. This fact has been established by the experiments of Fontana, Michaelis, Arnemann, Cruickshank, Haighton, Mayer, by Bychat, and by the more recent observations of Swan, Descot, and Larrey.

The re-union of divided nerves is attended by the following phenomena:—the ends of the nerve retract; the extent of the separation is from two to six lines or more, and is greater in large nerves than small ones. This separation of the extremities of a divided nerve is not owing to elasticity, but is the result of an organic action, or contractility of the neurilema and surrounding cellular tissue; in proof of which it may be stated that divided nerves in a dead animal do not retract. Inflammation soon commences; the surrounding vessels contain more blood; the nerves become of a red color, and are thicker; the inflammation extends from half an inch to an inch above and below the divided extremities: the distension of the vessels, the redness and swelling, are, however, more remarkable in the upper than the lower end. Coagulable lymph is deposited around the separated nerves, and in this lymph minute vessels are observable. In consequence of this deposition in the sheath of the nerves, and among their fibrils, the nerves appear enlarged, the swelling is greater in the upper than in the lower ends. Similar enlargements are discoverable after the lapse of time, in the ends of nerves divided in amputation.

The coagulable lymph effused during the inflammation, connects the divided nerves in the course of a few days; it gradually assumes a further consistence, and the blood-vessels dispersed through it appear to contract, or to contain less blood. The enlarged or bulbous extremities of the nerves, gradually approaching nearer to each other, at length become incorporated, and thus the connection of the divided nerves is re-established. If the swelling be examined after some time, it is found reddish externally, and exhibiting fibrils similar in appearance to the nervous fasciculi, and by means of these the nerves become perfectly continuous.

Whether the substance connecting the nerves is similar in organization to the original nerve, and is capable of transmitting sensation, and the influence of the brain in the performance of voluntary motion, are questions which have divided the opinions of physiologists. Ar-

nemann rejected the opinion that the regeneration of true nervous substance took place, having found, that 150 days after their division, the parts supplied by such nerves, were destitute of sensation. Breschet, Richerand, and Delpech adopted the same view.

Fontana, on the contrary, Michaelis, Mayer, Cruikshank, and Haighton, maintain that the re-union of divided nerves take place by means of true nervous fibrils. Michaelis recognized these fibrils by the microscope, and Mayer demonstrated them by the test of nitric acid. Haighton, in proof of the regeneration of nervous matter, stated that the re-united *nervi vagi* were capable of performing their natural functions. He divided the nervus vagus of the one side in a dog, and in six weeks afterwards, that of the other side. The animal lived; but when the two nervi vagi were divided at the same time, or in a shorter interval, the animals invariably died.

From the preceding experiments and observations, Tiedemann considered it highly probable, that true nervous matter was regenerated; he thought, however, that the return of sensation, and the power of motion in parts whose nerves had been divided, was not established so satisfactorily as was desirable. He therefore instituted some experiments on the subject, and one of the most conclusive of these he has detailed nearly as follows. On the 16th of August, 1827, having exposed the brachial plexus of nerves (*arm-nerven-Geflecht*) in a dog, he separated the several nerves, and cut out of each a portion from ten to twelve lines in length. The leg and foot were immediately deprived of sensation, and the power of motion. The wound healed within three weeks, but the leg and foot remained without sensation, or the power of motion, for a long time. It became smaller than the opposite one, and, in walking or running, was drawn upwards by means of the muscles of the shoulder.

In May, 1828, eight months after the excisions of the portions of nerves, the animal began to use the foot in progression, and showed signs of sensation when it was much pressed, or was pricked with needles; and during this and the following years, sensation and motion were gradually but perfectly restored. In order to examine the condition of the nerves, the animal was killed on June 2d, 1829, twenty-one months after the operation. Where the portions of nerves had been removed, at each extremity of the incision an oval enlargement was found, which was greater at the end nearest the body than the opposite one. In the interval between these enlargements, and connecting them, newly formed portions, apparently of nerve, were seen. These intermediate portions were thinner than the uninjured parts of the nerve. In order to ascertain whether the regenerated parts really consisted of nervous fibrils, a portion was laid on a piece of glass and nitric acid applied, but the integrity of the structure remained unimpaired. Hence, from the return of the power of motion and sensation, from the structure of the newly-formed portion, and from the test of nitric acid, Tiedemann concludes this experiment to supply a demonstration of the regeneration of true nervous matter.

Numerous cases are related, for the most part by English authors, (as Abernethy, Balfour, Pring, and Swan,) of the restoration of sensation after the healing of wounds, in which nerves were divided either by accident, or in operations for the relief of neuralgia. Of these the most remarkable is related by Abernethy; and one very analogous to it, has been communicated to Tiedemann by Dr. Shott, of Frankfort.

A woman, 40 years of age, had suffered most severely for fourteen years, from neuralgia of the ring-finger, particularly of the last joint, for which she could not obtain any relief. Dr. Shott determined, therefore, to remove a portion of the cubital nerve. He laid bare the trunk of this nerve above the inner condyle of the humerus, and removed a portion of it an inch long. After the division of the nerve, the neuralgia immediately ceased, and the ring and little finger of that hand were deprived of sensation. In order to prevent the re-union of the ends of the nerve, the wound was dressed to the bottom, and healed by suppuration. After three months the wound was cicatrized, and there was no return of neuralgia; but gradually sensation returned in the fourth and fifth fingers, and after six months had elapsed, she again suffered severe pain in the ring-finger, which, however, did not become so violent as before the operation.—*Lond. Med. Gaz.*

15. *The Diving Bell a Remedy for certain Diseases.*—An interesting account of the descent in a diving Bell of Mr. Clifford, of Exeter, N. H. and Capt. Tripe, of Dover, is published in the last number of Silliman's Journal, in which the Reverend author states some facts leading him to the conclusion, that excursions of this kind may be useful in cases of Rheumatism. The pulse, on emerging from the bell, was quick, and perspiration very profuse, and the gentlemen found themselves in a fit condition for a comfortable sleep. It seems, therefore, not unreasonable to expect some relief in cases requiring stimulating diaphoretics, and to which quiet repose is so greatly desired; but since the common sulphur bath accomplishes these objects in a much more speedy and convenient manner, we can hardly expect that the diving bell will be a very general resort for these purposes. The fact, however, of the peculiar influence of these descents on the several functions, should be known to medical men; and we will close this part of our notice of it, by a brief extract from the interesting paper of Mr. Alden.

Mr. Clifford had, for many years, been afflicted with rheumatic pains. During the several weeks he was engaged in this enterprise, *he was remarkably free from this complaint.* The first time he descended in the diving bell, he happened to be considerably affected with his disorder; but, on coming out of it, he was entirely relieved from pain, insomuch that he walked, directly after, six miles, without inconvenience. This was an exertion which he had not thought himself able to make for several years before.

Could a series of experiments be instituted, on proper subjects, who will venture to say that the result would not be so much as to

render a sub-marine descent, in a commodious diving bell, a frequent and favorite adventure?

But this is not the only view in which these excursions are to be considered by the physician. The very singular effect they have long been known to produce on the organ of hearing, may possibly lead to more useful results.

In descending, says Mr. A. a painful sensation was induced on the tympanum, attended with a noise, as Mr. Clifford informed me, not unlike that of a fly entangled in a spider's webb, till the adventurers were at the depth of about twelve feet, when, experiencing a sudden shock, they were completely relieved. This painful sensation, the shock, and subsequent relief, were regularly repeated, as nearly as could be judged, every twelve feet. After a few descents, it was perceived that, by being raised a foot or two, every eight or ten feet, the shock was avoided, and the men were freed from that painful sensation, which had resulted from the uniformly increasing density of their atmosphere.

Upon the above, Dr. Mease, who communicated the account to the American Journal, makes the following remarks:—

The painful sensation in the ear, mentioned in the preceding paper, is invariably experienced by those who descend in diving bells, owing to the compression of the condensed air on the membrana tympani; but the means of preventing it, which were discovered by Messrs. Clifford and Tripe, are not mentioned in any of the accounts of diving which I have read, nor do the writers of them notice the 'shock' felt by the Portsmouth divers which immediately preceded their relief from the pain. Dr. Hamel, of St. Petersburgh, states that he was relieved of the pain by making exertions to admit air through the Eustachian tube into the ears, but succeeded in accomplishing this at first only on one side, when the air rushed into the cavity of the right ear, and the pain ceased instantly; when in the diving bell, he was not aware of the simple way in which it was effected. Dr. Wollaston informed him, that nothing is wanted but to swallow the saliva, as may be seen from the following simple experiment. Close your nostrils with the fingers, and suck, with the mouth shut: air will come through the Eustachian tube from the ear, and you feel pressure on the membrana tympani, which prevents you from hearing distinctly. As the end of the tube nearest to the mouth acts like a valve, this sensation will often remain even after you have ceased sucking. To remove it, nothing is wanted but to swallow saliva, whereby the action of the muscles seems to open the end of the tube, and then the air rushes in to re-astablish the equilibrium. During the descent of the bell, Dr. Hamel says that the pain returned, but as he repeated his exertions to open the Eustachian tube, the air at intervals found a passage through it, and he obtained relief. Through the left Eustachian tube no air had yet passed, and the pain in the left ear was gradually increasing; when about fourteen feet under water, the sensation was as if a stick was forced into the ear from without: at last, during one of the exertions to open the mouth of the tube on that side, the

air forced its way in with considerable violence through it, and he was relieved from the pain also on that side. I presume the 'shock' experienced by the Portsmouth divers, arose from the rushing of the air into and through the tubes, as it took place immediately preceding their obtaining relief from the pain in their ears. It may be useful to state, that this pain will be much diminished, if the bell be allowed to descend slowly, so as to admit the air gradually into the ear. In ascending, Dr. Hamel says that the pain returned, resulting from the air of the inner cavity of the ear expanding, as the external pressure was diminished; but it was more easily relieved, the air gushing occasionally from the ear through the Eustachian tubes into the mouth.

Dr. H. suggests the probability of the diving bell being used with success for the cure of deafness, in those cases where it depends on an obstruction of the Eustachian tube. The patient would have to go down in a diving bell, and make exertions to open the mouths of the Eustachian tubes, and then by the pressure of the condensed air it would be forced through the extent of the tube, and thus clear the passage. He thinks that the fact of such slight obstructions having been frequently removed by forcing air or tobacco smoke from the mouth into the ear, gives weight to the idea: but it is questionable whether the deaf person would be able to bear the great pain which it is reasonable to suppose he must endure from the condensation of the air on the tympanum, until the removal of the obstruction; and his sufferings might be so great as to deprive him temporarily of his presence of mind, and even of his senses. The experiment ought not therefore to be made, unless another person enjoying his hearing accompanied the patient. I have more well grounded confidence in syringing the ears with warm milk and water, to remove hardened wax. The relief experienced by Mr. Clifford from the rheumatism, after his diving, is well worth consideration by the faculty.—*Bost. Med. and Surg. Jour.*

16. *Observations on Club Feet.*—M. Dupuytren, lately exhibited at his clinical lecture an infant born in the Hotel Dieu, having two strongly marked club-feet. The learned surgeon took the opportunity of making the observations which follow.

Club-foot is for the most part a congenital deformity, in which the foot is turned very much inwards, the sole being nearly perpendicular, and the external edge looking down, so that the individual rests upon it, or, when the deformity is very great, even on the outer ankle. At the same time the cavity of the sole of the foot appears to be augmented. All these external phenomena have been well described by Scarpa and others. Scarpa and M. Cruveilheir have also occupied themselves with the interior appearances displayed by dissection, but none of them have sufficiently dwelt on the most important results of the club-foot—namely, the diminished nourishment and atrophy of the limb.

Congenital club foot is either limited to one or involves both members. In the former case, if the infant be examined very soon after

its birth, the deformed foot is found to be rather smaller than the other, but the legs are of equal length. M. Dupuytren has had numerous opportunities of satisfying himself on this point. When both feet are affected, they are in general equal in point of development. This kind of premature atrophy, the unknown cause of which is probably connected with that of the deformity itself, produces as a consequence a secondary wasting, which extends to the entire limb, and the source of which may be better explained. In fact, the infant, from the day he begins to walk, constantly makes use of the sound limb chiefly, resting the weight of the body almost always upon it. The nutrition bears proportion to the exercise; while the other limb, almost unemployed, wastes, in consequence of its inactivity.

Now this atrophy takes place in two different ways, which have hitherto been confounded, but which ought to be distinguished. 1. The limb wastes in length; 2. it wastes in thickness. The wasting in breadth is but little manifested in the skeleton, though much in the muscles, and hence the weakness and thinness of the limb—a vexatious circumstance, it is true, but one which may be remedied by calling the parts into exercise. The atrophy, as to length, takes place both in the bones and in the muscles, but is developed in the skeleton, which is most important, and thence proceeds a shortening of the limb, which no remedy can cure. The difference in length between the limbs increases in direct proportion to the age. Not perceptible at birth, it becomes obvious some years after; and at the age of ten, M. Dupuytren has always found it well marked, and still more so at twenty, if no means of prevention have been adopted.

The shortening of the muscles and tendons, less considerable in general, becomes nevertheless irremediable after a certain time. Thus at twenty, the tendo-achillis has so lost its due length, that when the foot has been brought to its natural direction, the heel continues to be pulled upwards, so as to oblige the individual to have a very thick sole to the heel of his shoe, in order to be able to rest at all upon the part. It is therefore desirable to prevent as much as possible this shortening of the bones, because when it once takes place it is irremediable. According to these views, M. Dupuytren requested several practitioners who devote themselves especially to such cases, to begin the treatment immediately after birth: he sent four or five infants of very early age, to an establishment for 'Orthopedy,' where they remained not more than five or six weeks. The deformity was completely corrected, so that the children learned to walk in the usual manner; and the limb, never having lost its length, performed its functions in the usual manner. I witnessed the results, said M. Dupuytren—I kept the individuals in view—and ascertained that the deformity did not return; and I affirm that, by treating club-foot thus early, the wasting of the limb may be avoided with certainty.

It may be added, that the younger the infant is, the more readily will the foot yield to pressure. In a new-born babe the hand of the surgeon is sufficient to restore its natural form to the foot, and that without causing any pain. A few months more, however, increases

the difficulty; and when the patient has passed his tenth year, machinery is required to accomplish the end in view. After twenty, even mechanical contrivances fail to be of service. This depends upon three principal circumstances: 1. The suppleness of the ligaments and muscles, which continues to diminish as the age increases; 2. The increase of the difficulty itself; 3. The imperfect formation in which the bones are developed, which last is decidedly the most powerful cause.

In conclusion it may be stated, that the treatment of club-foot, if undertaken at birth, is easy and simple: it is both completely preventive and curative.—*Bost. Med. and Surg. Jour.*

17. *The Resurrectionists.*—It has been our belief that no possible method could be devised for rendering secure the sacred mansions of the dead, but that which was recently adopted by the Legislature of Massachusetts, and soon after by the Parliament of Great Britain. In both countries the remedy has been effectual. By abolishing the office of the resurrectionist, it rids the community of the whole band of speculators, from whom alone violation of the grave could be apprehended; the remains of mortality that rest in the earth, repose there in security, and the minds of surviving friends are no longer harassed by the fears that, in times past, added so much to the poignancy of grief at the death of a relative or friend. Such fears were well grounded; they were rational, and it is therefore well that they are hushed. No man who possesses any thing of a philosophical mind, would object that his body, after death, should subserve the purposes of science and humanity; but it is quite a different thing to contemplate one's mortal part deposited as a temptation to crime, and made an article of speculation. The apprehensions, therefore, that grew out of the former state of the law, respecting dissection, are, in more than one view of the subject, entirely put at rest. The grave is effectually protected, and the means of anatomical knowledge supplied, and the only circumstance attending dissection that could disturb the dying or annoy his friends, necessarily dispensed with.

The following notice in an English Journal illustrates the effect of the late law on this subject, in England.

Some of those desperate men who have heretofore lived by the plunder of the grave, have been endeavoring, in various ways, to annoy and disturb the anatomical teachers in the metropolis. In some instances, they have endeavored to create disturbance, with a view of extorting money; in others, they have tried to obtain employment at their old occupation, offering to furnish 'subjects' for two pounds each, instead of twelve, the average price of last year. Thinking the temptation would be too strong to be resisted, a party of them last week, went one night to several schools with two bodies, offering them for anything or nothing: at last they pressed one gentleman for heaven's sake, to take the bodies, were it only to bury them, for they were fearful of being detected, as no one would give them admission. We can confidently state, that the determina-

tion peremptorily to decline all connection with these men, has not been deviated from in a single instance, and thus the public has been the first to gain by the new act; for the temptation to rob the grave ceases with the possibility of disposing of the plunder, and thus may the friends of the deceased feel assured that their '*requiescat in pace*' will not be in vain—that hereafter, the grave will, indeed, be sacred.—*ib.*

18. *Effects of Darkness in producing Deformities.*—A correspondent writes us the curious fact. There is at present in Paris an artist of the Louvre, an eminent historical painter, of the name of Ducornet, who paints with his feet. He was born without arms, of poor parents, at Lille. There are also about the French metropolis a number of beggars, twelve or thirteen of them at least, all deformed in various ways, and all born at Lille, in certain dark caverns under the fortifications. The effect of these places, from their want of light producing malformed births, is so notorious, that the magistrates of Lille have issued strict orders to prohibit the poor from taking up their abode in them. It is added by our correspondent, that he had a conversation with Mr. Edwards on the subject, and that gentleman was greatly struck with the confirmation which the above circumstances afford to his views, stated in his work, *Sur l'influence des agens physiques sur la vie.* Mr. Edward's experiments of detaining tadpoles in darkness and thus causing them to grow into gigantic and monstrous *tadpoles*, instead of being transformed into frogs, are well known.—*London Medical Gazette.*

19. *Insomnolence cured by Sulphate of Quina.*—Mr. Barbier, of the Hotel Dieu, Amiens, relates the following case:—A man, aged 42, had cholera, from which he recovered; all the functions were restored, except that his sleep was destroyed: scarcely had he an hour's rest altogether in the course of each night; laudanum and other soporifics were exhibited without effect. Mr. Barbier found, on examination, that every evening he had a nervous 'agitation,' which lasted all night, accompanied by some pain in the head and limbs. Looking to the *periodicity* of the affection, M. Barbier ordered six grains of sulphate of quina every night. It was given two nights; he slept well; it was then omitted; he had no rest. The medicine was again renewed, and continued, with the effect of permanently procuring six or seven hours of sound sleep.—*Gaz. Med.*

20. *Treatment of Scrofula by Iodine.*—M. Baudelocque, physician "de l'Hopital des Enfans," communicates an interesting memoir on the results of his practice in strumous disease. Sixty-seven girls, from the age of four to fifteen years, were treated by iodine in its different preparations. In all, the disease had existed for a considerable time, varying from nine years to ten months. Fifteen of these children were completely cured; fourteen so much improved, as to indicate a speedy cure: thirteen experienced less benefit than the preceding, but

still sufficient to warrant hopes, though distant, of their recovery; five exhibited little, and twenty no amendment at all. All these patients with scarcely an exception, were much worse when they commenced the use of the iodine, than at the period of their admission into the hospital. Far from having derived any advantage from their residence there for several months, or even years, their condition was manifestly less favourable. This remark is well worthy our study, as it disproves the assertion of those medical men, who state that scrofula has a definite duration in the system, and that, after a certatn lapse of time, it is easily cured, whatever remedies are employed. M. Baudelocque is satisfied, that the length of time during which the disease has existed in any case, had no influence in assisting or in quickening the cure of the numerous patients under his care.

Of the 67 cases, 17 had an enlargement of the glands of the neck, jaw, and arm-pits; they took iodine inwardly, and employed likewise iodurettted baths, and friction with ointments of the potassæ hydriodas, plumbi ioduretum, et hyrargyri proto-ioduretum.

The mode in which the discussion of these enlargements is effected, makes us well acquainted with the nature of their formation; they consist of an aggregation of numerous small tumours, united together by cellular texture, which, in course of time, becomes firm, and increased in extent. In proportion as this cellular substance is dispersed, and returns to its normal state, the small glands, which are less quickly absorbed, become moveable and disjoined, and these, again, are resolved into several still smaller, until they quite disappear. To prevent the deformity of the scars so frequently left after a scrofulous abscess, the loose skin must be destroyed, either by the knife or by caustic, during the cicatrization of the sore, and a new healthy skin will be formed, so as to cause little disfigurement.—*Revue Medicale.*

21. *Natural History of Man.*—M. Geoffrey Saint Hilaire concludes an interesting memoir by stating that females are generally much shorter than the males, in those races of mankind whose stature is great; the difference being much less among the people of low stature; that the most remarkable for tallness, for the most part inhabit the southern hemisphere, while the most diminutive are found in the northern one; that among the very tall races some live in South America, others in the South Pacific Archipelago, between the 10th and 50th degree of south latitude; that some very diminutive races live in the southern hemisphere; and that some tall races are found in the northern hemisphere; and if we compare the geographical position of these various divisions of mankind, we arrive at the curious result, that the diminutive races are almost always found near the verv tall, and the very tall races near to those of low stature; that the variation in the size of different races may be explained in part by the influence of climate, diet, and mode of life—that it is extremely probable that the stature of the human race has not sensibly diminished, since the earliest age of history, or even from long anterior to that epoch.—*Ib.*

22. *Medical Jurisprudence. On the Decomposition of the Animal Structure.*—M. Oliver, and M. Denis were desired to examine the body of a female, who had been interred three months before, as suspicions had been excited that she had been murdered by her husband, and had died of the effects of blows upon her head, and fracture of the skull. The husband alleged that he had obtained the authority for interment from the physician appointed to ascertain the cause of his wife's decease; but it appeared that the physician had never examined the corpse, but had trusted to the husband's declaration that she had died from a rupture of a blood-vessel. The deceased was 55 years of age, and had been affected with hemiplegia for nine years. The body was buried the day after her death, in a dry chalky soil.

When exhumed, it did not present the appearance of much decay; the external surface, and the pectoral and abdominal viscera were little altered; but on examining the head, the right hemisphere was found softer and more decomposed than the left one, the anterior lobe was converted into a fatty matter, semi-consistent, and quite similar to what covered all the surface of the brain and spinal marrow, in the place of the pia mater, which had altogether disappeared. A similar greasy substance was discovered in both pleuræ, posterior to the lungs, which were quite shrivelled and dry. M.M. Oliver and Denis were led to the conclusion, that adipocire was formed at those parts where blood, or a bloody fluid had been deposited, and that, therefore, this female had died of a cerebral hæmorrhage. Such was their opinion, founded partly on the greater softness of the right hemisphere, and partly on the fatty degeneration of the anterior lobe, which indicated that it had been the seat of the hæmorrhage; else how was the fatty deposit not found in other portions of the cerebral substance? The occurrence of a similar matter in the two pleuræ is easily accounted for on the same view of the subject; for we know that in rapidly fatal apoplexies, there is generally an excessive congestion of blood in one or in both lungs; and it is but probable to suppose that after death there may be a gradual sudation of the same into the cavities of the pleuræ.

The husband was acquitted on the strength of the medical evidence. —*Ibid.*

23. *Rhinoplastic Operation.*—The patient had been long affected with an enormous cancer of the nose, which had resisted every treatment. M. Biandin, having completely excised the diseased part, detached from the forehead a flap of integument, and shaped it to the stump of the nose; but he did not divide the pedicle of the flap, as has been usually done; instead of doing this, he separated the skin from it, and then cut away the integuments from the root of the nose; the opposite raw surfaces were brought together, and quickly united. By this maneuvre, the new nose continued to retain its communication with the blood-vessels and nerves, which imparted life to it at first, and was thereby much stronger and less likely to be affected by cold and other accidents.—*Journal Hebdomad.*

24. ***Curious Case, in which the real Sex of a Child was not discovered till he was*** *18 years old.*—E. D——c, was born on the 13th August, 1812, and appeared to be a female, was registered as such, and educated as a girl till 1831. In June of this year she consulted M. Gendrin on account of opthalmia in both eyes. He was struck with the beard on her face, the bass tone of her voice, and the development of the pomum Adami. The catamenia had not appeared. Subsequently she mentioned that there was an irregularity in the genital organs, and that the irregularity had been increasing ever since the age of puberty, which with her commenced about six years before, as indicated by the change of voice, and the black, stiff hair which appeared in different parts of the body. The mother stated that her child, when young, had the activity, and had always preferred the sports of boys, to the quieter amusements of girls.

She has not shewn any attachment for either sex. On examining the genital organs, a longitudinal fissure, like a valve, extended from the inferior edge of the symphisis pubis to near the anus. Rather higher up than the usual situation of the clitoris, was observed a loose cylindrical organ, 15 lines long and about five or six thick, covered by a very fine and extensible membrane, and ending in a regularly formed glans, having a corona round its base. The vena dorsalis penis was seen on its upper surface. A prepuce covered one half of its surface; the skin of which this prepuce is formed, was continuous with the margins of the vulva-like fissure in the perineum. Along the under surface of this organ was a deep channel, or groove, which terminated posteriorly in the vulva, and at this point of junction were observed five open, irregularly arranged orifices, not unlike those of the vasa efferentia round the verumontanum. A smooth mucous membrane covered the surface of this gutter, which was in lieu of a urethra, and it presented faint traces of the longitudinal furrows observed in the natural passage. With much difficulty the finger could be introduced to the depth of three inches, into the vulva, but no opening was detected in it. A straight instrument might be passed in the direction, from the symphisis pubis to the middle of the sacrum, for three inches and a half; and when the finger was carried up the rectum, the instrument might be felt, and it was ascertained that there was not more than two or three lines thickness of substance interposed. Two elastic roundish bodies were felt by the finger round the supposed neck of the bladder; these were probably the lobes of the prostate. No meaus urinarius could be perceived; but, as the water was discharged downwards, the orifice must have been situated in the perineal canal. At first, this canal was considered to be merely a dilated urethra, but the circumstance of the straight instrument being stopped at the depth of three inches and a half, and not appearing to be embraced by a tight canal, contradicted this idea. By perseverence, however, a curved instrument directed upwards, was passed into the bladder, and the finger in the rectum did not discover any intervening substance, but the mere walls of the gut and bladder—a thickness of four lines at most. There was no trace of scrotum, testicle, or of spermatic cord.

The mammæ were not at all developed. The young person declared that the cylindrical organ, or imperfect penis, was sometimes enlarged and erected, and the erections had occasionally been followed by a discharge of a whitish, thick, viscid fluid. The rami of the pubes and the tubera ischii were more approximated than usual; the hips projected; the buttocks flattened, and the thighs not rounded, and verging inwards as in females. The mons veneris, the linea alba, the chest, chin, and cheeks, and the extremities were covered with hair, and the general configuration of the body was decidedly masculine.

The medical men, after a most careful examination, concluded that the sex of the person had been mistaken, and the civil tribunal, therefore, ordered that the registry should be altered, and the surname changed to that of a male.—*Revue Medicale.*

25. *Probable Case of Extra-Uterine Pregnancy.*—Madame E. on the 26th Feb. 1817, was suddenly much terrified, *while receiving the embraces of her husband*, by the fall of a stone which had been thrown against the window of her bed-room. She had no family hitherto, though she had been married for 12 years. The catamenia had regularly appeared till after this date, when the other symptoms of pregnancy presented themselves. On the 13th April, she had a violent attack of bearing down, and of excruciating pain in the left side of the hypogastrium, which very closely simulated the threatening of an abortion. The symptoms gradually passed by, but again returned in two months. On the 6th Dec. all the signs of child-birth came on; but the physician could not, by examining, reach the os uteri with his finger. After a few hours of suffering, all pains left her, and from this moment the motions of the child, which had hitherto been very obvious, altogether ceased. For three months after this date, she had repeated attacks of inflammation in the abdomen, when, very unexpectedly, the catamenia re-appeared, and health was quickly re-established. The belly, however, remained very large. After two years of widowhood she again married, and enjoyed good health till April, 1824, when she died from an attack of peritonitis, followed by diarrhœa. On opening the abdomen, the fœtor was insupportable, and M. Beclard, therefore, contented himself by removing the tumour along with the uterus, to which it adhered, the fœtus was of the female sex and of the full size; it was enclosed in a bag, situated to the left of the womb, and was in a great measure coverted into a fatty matter, like adipocire.—*Archives Generales.*

26. *Torsion of the Arteries after Surgical Operations.*—Case I. A young man's leg was amputated by the circular incision. The anterior and posterior tibial, and the peroneal arteries, were twisted in the simple manner recommended by M. Amussat, without any previous laceration of the internal and middle tunics. The time occupied was much shorter than required for applying three ligatures; one of the tibial veins, which was bleeding profusely, was likewise twisted. There was an oozing, more serous than bloody, from the wound for se-

veral days. The wound did not heal favourably, as the patient's health was not good; in six weeks, however, the stump was quite cicatrized.

Case II. A woman, aged 48, had her thigh amputated; the femoral artery, well detached from the accompanying nerve, was twisted—only one other vessel required torsion. On the fourth day the bandages were removed; they were dry and very little stained; the wound was quite healed in four weeks.

This patient having subsequently died of phthysis, an opportunity was afforded of examining the vessels; the femoral artery was closed exteriorly by condensed cellular membrane, and plugged inwardly by a fibrinous white clot. Its walls and calibre were quite normal.

Case III. A man, aged 52, was admitted into the hospital with an enormous diffused, aneurismatic swelling of the lower third of the thigh: amputation was performed at the upper third. The femoral artery was attempted to be twisted, but it gave way at the third turn of the hand, leaving a gaping orifice; a ligature was, therefore, applied —the muscular branches were, however, secured by torsion. For several days after the operation, there was an inconsiderable serous oozing from the wound, which, however, was completely cicatrized in about six weeks.

Case IV. A man, aged 24, had cancer of the penis, which required removal by the knife; five arteries were twisted. It was found much more difficult to detach these vessels from their connexions than in the previous operations. The wound healed within a month.

In addition to the above cases, several others are alluded to, of amputations, in which complete union of the wound took place in 6, 8, 12, 15, and 18 days.—*Journ. Hebdom.*

27. *Permanent Contraction of the Fingers cured by Dividing the Palmar Aponeurosis.*—Dupuytren has now performed this operation with complete success in upwards of twelve cases: and very lately he had a most satisfactory opportunity of confirming his opinion of the cause of this malady by dissection. An old woman died in the hospital; and it was found that three of the fingers were contracted. The skin of the hand and of the fore-arm having been very carefully dissected off, the aponeurosis was observed very distinctly to be drawn together. Wishing to shew that the distortion of the fingers was not at all dependent on any lesion of the tendons, Dupuytren divided them across, one by one; but yet the fingers could not be straightened; a direction was now carefully introduced beneath the palmar fascia, and this divided; and immediately the fingers could be bent back to their natural position—*Ib.*

28. *Capsicum in Hemorrhage.—To the Editor of the Boston Medical and Surgical Journal.*—Sir,—If you could induce Professor Tully or any one of your correspondents who is familiar with the article, to furnish you with a dissertation upon *capsicum*, you might probably be of more service to the profession than by giving to the public the same quantity of matter upon almost any other subject. It has long been

pretty extensively and very advantageously employed as a gargle, in angina maligna, and other affections of the throat. It is also considerably used in some complaints of the stomach, and in the latter stages of most typhoid diseases. I have however, considered it as more valuable in *passive hemorrhage* than perhaps any single article of the materia medica. In this case, it may be employed in doses of three to five grains in pill, and may be repeated every ten or fifteen minutes, to the third or fourth time, in almost any instance, of a sudden profuse loss of blood, whether it is from the lungs, uterus, nose, stomach, or rectum. It generally answers when given alone, but its effect is usually more certain when each dose is combined with one or two grains of sugar of lead, and half a grain or a grain of opium.

Notwithstanding capsicum is so very important in hemorrhage, I do not know that its stiptic property is mentioned in the common treatises upon materia medica; and I suspect that the number of practitioners who employ it in this way is very limited.

Should this hint serve to call forth some abler pen to furnish a dissertation upon the subject, my end will be answered. SENEX.

29. *The Ornithoryncus Paradoxus.*—The following interesting fact in natural history was communicated by Dr. Weatherhead to the committee of science of the Zoological Society at their last meeting.

For the last five-and-twenty years naturalists in Europe have been striving to obtain the carcase of the impregnated female *Ornithorhyncus Paradoxus*, for the purpose of ascertaining its mode of gestation, but without success; for it is by dissection alone that the hitherto doubtful and disputed point concerning the anomalous and paradoxical manner of bringing forth and rearing its young can be satisfactorily demonstrated. This long-sought for desideratum is at length attained. Through the kindness of his friend, Lieut. the honorable Lauderdale Maule, of the 39th regiment, Dr. Weatherhead has had the bodies of several *ornithorhynchi* transmitted to him from New Holland, in one of which the ova were preserved; establishing, along with the other curious circumstances ascertained, the extraordinary fact, that this animal, which combines the bird and quadruped together in its outward form, lays eggs, and hatches them like the one, and rears and suckles them like the other.—*Proc. Zool. Soc.*

30. *Curious Anomaly in the Distribution of the Bloodvessels.*—The infant was born with imperforate anus, and lived for seven days. Dissection shewed that the rectum terminated in a cul de sac, about an inch above the os coccygis, which was but imperfectly developed. From the arch of the aorta, was given off, first, a trunk common to the two carotids; next the left subclavian; and lastly the right subclavian, arising from the extremity of the arch, and then crossing to the right side between the œsophagus and the vertebræ; the abdominal aorta having supplied the cœliac, superior Mesenteric, right renal, (the left was wanting, and likewise the kidney of this side) and sperma-

tic vessels, divided into two branches on the second lumbar vertebræ. One of these, by far the largest, and appearing to be the continuation of the trunk, gave rise to the inferior mesenteric, and then crossed to the posterior surface of the bladder, along the median line of the umbilicus, where it divided into two. The other branch, situated behind the former, first followed the course of the sacrum, then was reflected upwards to the right sacro-iliac synchondrosis, having first supplied branches to the left lower extremity, and left side of the pelvis. The continuation of this vessel formed the right femoral. The system of the sympathetic nerves appeared to follow the irregularities of the arterial distribution—there being only one sacral ganglion, and no coccygeal.

M. Jodin, who has reported this case, is of opinion that the imperfect development of the rectum was dependent on and caused by the imperfect development of the pelvic blood-vessels, and very properly directs the attention of medical men to examine whether the connexion always exists.—*Archives Generales.*

31. *Dissection of a person who died from Inanition.*—A prisoner at Toulouse died after having refused to take food for 63 days.

Universal emaciation; weight of the body about 58 pounds. Brain of a paler color than natural; no water in the ventricles; cortical substance of healthy consistence; medullary substance of the cerebrum, cerebellum, and the medulla oblongata, considerably firmer and denser than is usually observed. Heart of the ordinary size, but very pale in color; soft and easily torn; lungs nearly normal; œsophagus contracted; stomach of its ordinary size, and containing an ounce or two of greenish fluid; mucous membrane adhering strongly; the thickness of the walls of the stomach and intestines sensibly diminished; valvulæ conniventes very distinct; hardened fæcal matter in the right portion of the colon; the rest of the intestines empty. The omentum reduced to a mere serous web, which was traversed by blood-vessels. Mesentery containing no fat. Liver of a healthy color and size; its substance denser than usual. Gall-bladder distended with a black, thick, bile, which was like a strong solution of extract of liquorice. Spleen exceedingly small, almost round, with a diameter of about two inches; texture very dense and resisting pressure. Kidneys reduced in size, and of very firm consistence. Muscular system almost "annihilated," so shrivelled were the fleshy "ropes of life." Though no trace of fat was to be observed, the marrow was not deficient in the long bones.—*ib.*

32. *Tumour—the remains of an old Hernial Sac in the Sheath of the Spermatic Cord.*—A man, aged 29, had a tumour in the spermatic cord, situated between the inguinal ring and the testicle, of the size of a walnut. It has been there for fifteen years, and given little annoyance till three months ago, when it began to increase in size and to become more painful. When carefully examined, it conveys to the finger the sensation of an enclosed fluid; the ring, cord, and testicle are

not involved with it. The patient states, that at first the swelling might be pushed up to, but never within, the original canal. It was considered to be either an encysted tumor of the cord, or the remains of an omental hernia, or a fleshy or scirrhous tumor. M. Roux extirpated it. On puncturing it, a quantity of pale yellow serum flowed out. Death, from fever, took place a fortnight after the operation, and on dissecting the inguinal canal, the omentum was found adhering all round to its circumference. M. Roux gave it as his opinion that the tumor which was removed, had been an old hernial sac, the open neck of which had been in course of time obliterated; and stated what tended to confirm this was, that during the operation it was found to be very much more coherent at its upper than at its lower part.—*Jour. Hebd.*

33. *Retention of Urine caused by a Foreign Body in the Rectum.*—A man, aged 67, had suffered for several months from tenesmus and strangury, the urine dribbling away very slowly, and the desire to void it being very frequent. Many surgeons had attempted, but in vain, to sound him, with a view of curing a supposed stricture. On examining the rectum with the finger, a hard substance was discovered, pressing by one of its ends on the urethra; by the other on the coccyx, when removed it was found to be the bone of a partridge, which, from the patient's account, must have lodged there for two months at least. He was immediately restored to health.—*Archives Generales.*

34. *Arresting Hemorrhage.*—Dr. Arentz, of Norway, recommends nitric acid as the most powerful means of arresting hemorrhage. In bleeding from a vessel too deeply seated to be easily accessible, or in false aneurism, he pours eight or ten drops of nitric acid into the wound.—*Casper Critisches Reporter.*

35. *To protect Iron and Steel from Rust.*—Heat the object until it burns the hand; after which, rub it with very white wax. Heat it a second time in order to melt off the wax, and then rub it briskly with a piece of cloth or leather to impart to it brilliancy. This operation renders the metal proof against rust from exposure to the atmosphere.—*Recueil Ind.*

ORIGINAL.

36. *Obituary.*—Died in this city on the 15th of October last, Dr. John E. Bush, for many years a highly respectable practitioner in this city.

Dr. Bush was a native of New-Jersey, in which state he completed his education, and was admitted to the practice of medicine in the spring of 1819. In the course of the ensuing summer he removed to this country and established himself in the practice of his profession in Brookville, Indiana, where, in a very short time, he acquired an unprecedented popularity and a very extensive practice.

Having been returned to the Legislature by the almost unanimous voice of his fellow citizens, in the session of 1822–3, he distinguished himself as an active, efficient, and influential member. Soon after, he removed to Cincinnati, where he formed an extensive acquaintance, and engaged in the practice of medicine with the most favorable prospects.

In 1827, Mrs. Bush was seized with a pulmonary affection which rapidly assumed the most alarming character, and induced the Doctor to relinquish his practice for the purpose of trying the effects of a southern climate. He left Cincinnati in the fall, with the intention of spending the winter in the West Indies, but the health of his wife declined so rapidly that they were compelled to remain in New-Orleans, where she fell a victim to her disease in March, 1828. He immediately returned to this place, where he continued to practice his Profession until his death.

On the evening of the 12th of October, soon after the appearance of the Cholera in this city, he was seized, after a day of excessive labor, with the premonitory symptoms of that disease. They were promptly arrested, however, and on the morning before his death he received the congratulations of his friends upon his fortunate escape. The symptoms, however, about the middle of the day, returning in the most aggravated form, he died in a few hours.

It was the happiness of the writer of this article to become acquainted with him while pursuing the elementary studies of his profession, and during an intimate acquaintance of years, he found him at all times exemplary in all the social and domestic virtues. He was a dutiful son, a tender and devoted husband, an affectionate parent, an ardent friend, and a public spirited citizen. Honest and upright in all his dealings, he abhorred every appearance of intrigue and unfair dealing in others not more than he avoided it himself. The friend of the poor—his readiness to relieve their distresses was only equalled by the kindness and sympathy with which his services were rendered.

As a member of the medical profession his pretensions were very respectable; his reading was extensive, and improved by a habit of original investigation. He was a member of the State Medical Society in 1828, and rendered valuable services in extablishing its present organization.

He was a man of easy manners, of varied powers of conversation, endowed with a lively and original vein of wit and humor, and of the most delicate sensibility. Fond of the study of nature and of the fine arts, especially the study of painting, he often amused himself with the pencil, in which he has left many mementoes behind him, happily conceived and neatly executed.

F.

PUBLISHER'S NOTICE.

The publisher of the Western Journal is happy to inform his patrons, that the course which the Journal has hitherto pursued, of knowing no friends, and recognizing no enemies, will still be rigidly adhered to. For the last six years, no pains have been spared to render it a neutral territory upon which individuals of every sect and party might meet with a certainty of having their rights respected and their just pretensions admitted. The public may rest assured that the Editors, under a presumption that in a world where so many sources of discord are at work, every individual has grievances enough of his own to attend to, will never be provoked, either by insult or injury, to prostitute to private malice or personal revenge, the pages of a work confessedly devoted to the interests of medical science.

E. DEMING.